

THE MEDICAL JOURNAL OF AUSTRALIA



VOL. I.—14TH YEAR.

SYDNEY: SATURDAY, MAY 7, 1927.

No. 19.

The Allenburys' DIET

A READY solution of the problem of feeding in most acute and chronic diseases, as well as in convalescence, is found in the use of "Allenburys" Diet. It is a complete, well balanced food, made from fresh full-cream milk and whole wheat, both of which are partially predigested during manufacture. This product is particularly valuable for invalids, convalescents, nursing mothers, dyspeptics and the aged. It promotes digestive ease and is well tolerated even in cases of extreme weakness. The "Allenburys" Diet keeps well, is readily prepared for use, and is pleasant to take.

The "Allenburys" Diet is quite distinct from the "Allenburys" Foods for infants.

Approximate Percentage COMPOSITION.

| | |
|---|------|
| Milk Fat - - - - - | 15.4 |
| Milk and Wheat Proteins - - - - - | 15.2 |
| Carbohydrates (Lactose, Dextrin-Maltose, etc.) - - - | 62.9 |
| Mineral Matter - - - | 4.3 |
| Moisture - - - - - | 2.2 |
| Calorific Value: 132.3 calories per oz. weight of powder. | |

A full sized package of this product will gladly be sent gratis to any Physician on request.

ALLEN & HANBURY'S (AUSTRALASIA) LTD.
13 MARKET STREET SYDNEY, N.S.W.



Exclusive Overcoat Lengths to measure by Peapes £10/10/- to £12/12/-

For men who desire Overcoats of decided distinction and value, these specially selected Overcoat lengths arrive at an opportune time—just at the beginning of the cold weather.

They comprise a most original variety of novel yet unobtrusive shades of Navy, Fawn, Brown and Blue in English Tweeds and Velours.

Their ability to give unusual wear is apparent at a most casual glance. This quality, combined with Peapes' excellent workmanship, ensures an overcoat not only superior in style but of retentive good shape and good appearance.

These Overcoatings are now on display in the Second Floor Showroom, but patterns and simple self-measurement form will be posted to out-of-town clients promptly on request.

Peapes pay postage.

Peapes & Co., Limited

Men's and Boys' Outfitters

GEORGE STREET (opp. Hunter Street), SYDNEY.

*P.P.P. (Peapes' Perfect Pipe) Old French Bruyere, unmounted.
hand-cut vulcanite mouthpiece, all shapes, 9/6.*

THE UNION TRUSTEE COMPANY of Australia, Limited

(ESTABLISHED 1885)

Paid-up Capital and Reserves, £166,000.

Acts in NEW SOUTH WALES, VICTORIA and QUEENSLAND as Executor, Joint Executor, Trustee, Administrator, Attorney under Power for Absentees, or in any other fiduciary capacity and is the only Australian Trustee Company with offices in more than one State.

ONE OF THE OLDEST AND LARGEST TRUSTEE COMPANIES IN AUSTRALIA

This Company offers so many advantages to Testators that it will repay you to obtain and peruse its free Booklets

DIRECTORS:

SYDNEY: James Kidd (Chairman); W. H. Mackay (Vice-Chairman); Hon. James Ashton, M.L.C.; Hon. Sir Henry Braddon, K.B.E., M.L.C.; R. M. Pitt; F. E. Bryant.
Manager: A. E. Norden, F.F.I.A., A.C.I.S. (Eng.). Assistant Manager: J. G. H. Shipway.

OFFICE: No. 15, O'CONNELL STREET.

MELBOURNE: H. M. Strachan (Chairman); Sir Robert Gibson, K.B.E. (Vice-Chairman); Sir George Fairbairn, K.B.E.; Bowes Kelly; Leland J. Greene; Sir David Orme Masson, K.B.E.; T. M. Stewart; Sir James A. M. Elder, K.B.E.
General Manager: Saml. Cooke. Manager: J. McEwan Carroll.

OFFICE: No. 333, COLLINS STREET.

BRISBANE: J. K. Stewart (Chairman); A. H. Whittingham; A. D. Walsh; W. J. Hooper;

LT.-Col. D. C. Cameron, C.M.G., D.S.O., M.H.R.
Manager: Charles Stewart. Assistant Manager: H. W. Herbert, B.Ec., A.I.C.A.

OFFICE: No. 398-400, QUEEN STREET.

THE MEDICAL JOURNAL OF AUSTRALIA

VOL. I.—14TH YEAR.

SYDNEY: SATURDAY, MAY 7, 1927.

No. 19.

Authors of articles submitted for publication are requested to read the following instructions and to comply with them.

All articles must be typed with double or treble spacing. Carbon copies should not be sent. Abbreviations should be avoided, especially those of a technical character at times employed in ward notes. Words and sentences should not be underlined or typed in capitals. The selection of the correct type is undertaken by the Editors. When illustrations are required, good photographic prints on glossy gaslight papers should be submitted. Each print should be enclosed in a sheet of paper. On this sheet of paper the number of the figure and

the legend to appear below the print should be typed or legibly written. On no account should any mark be made on the back of the photographic print. If no good print is available, negatives may be submitted. Line drawings, graphs, charts and the like should be drawn on thick, white paper in India ink by a person accustomed to draw for reproduction. The drawings should be large and boldly executed and all figures, lettering and symbols should be of sufficient strength and size to remain clear after reduction. Skiagrams can be reproduced satisfactorily only if good prints or negatives are available. The reproduction of all illustrations but especially of skiagrams entails the sacrifice of

time and energy and is expensive. Authors are expected to take a corresponding amount of trouble on the preparation of their illustrations, whether skiagrams, photographs, wash drawings or line drawings. The references to articles and books quoted must be accurate and should be compiled according to the following scheme. The order should correspond to the order of appearance in the article. The initials and surnames of the authors, the full title of the article or book, the full (unabbreviated) title of the journal in which the article appears, the date of the issue (day, month and year) and the number of the first page should be given in this sequence.

Table of Contents

[The Whole of the Literary Matter in THE MEDICAL JOURNAL OF AUSTRALIA is Copyright.]

| | PAGE. | | PAGE. |
|---|-------|--|-------|
| ORIGINAL ARTICLES— | | CURRENT COMMENT— | |
| “The Teaching of Hygiene in Schools,” by HARVEY SUTTON, O.B.E., M.D., B.S. | 668 | The Leucocytic Tide | 688 |
| “Head Injuries,” by T. E. LAMBERT, M.D., M.S. . . | 671 | Heart Murmurs in Severe Anæmia | 689 |
| “Notes on the Probable Life of Cercaria Catellæ, An Echinostome, Cercaria from New South Wales,” by BURTON BRADLEY, M.B., Ch.M., D.P.H. | 673 | Prognosis in Cancer of the Cervix Uteri | 690 |
| “Tonsillectomy with the Guillotine,” by CLIVE M. EADIE, M.B., B.S. | 676 | ABSTRACTS FROM CURRENT MEDICAL LITERATURE— | |
| “The Hospital Question in Victoria,” by DAVID D. BROWNE, M.B., B.S. | 677 | Bacteriology and Immunology | 692 |
| “Suicide,” by W. A. T. LIND, M.B., B.S. | 679 | Hygiene | 693 |
| REPORTS OF CASES— | | SPECIAL ABSTRACT— | |
| “Rheumatoid Arthritis Treated at Paralana Hot Springs, South Australia,” by C. C. FENTON, M.B., B.S., B.Sc. | 681 | Social Conditions and Acute Rheumatism | 694 |
| “Bilateral Melanotic Growth of Suprarenal Gland,” by R. M. SMITH, M.B., B.S. | 683 | BRITISH MEDICAL ASSOCIATION NEWS— | |
| “A Case of Hyperpyrexia,” by C. HUMPHREY LLOYD, M.B., Ch.M. | 684 | Scientific | 697 |
| REVIEWS— | | Nominations and Elections | 699 |
| Surgical Principles | 685 | PUBLIC HEALTH— | |
| Advice to Mothers and Nurses | 685 | Industrial Hygiene | 699 |
| Heart Disease and Rheumatism | 685 | CORRESPONDENCE— | |
| Quinine | 686 | Radiotherapy | 701 |
| The Salicyl Compounds | 686 | PROCEEDINGS OF THE AUSTRALIAN MEDICAL BOARDS— | |
| Education of the Public in Health Matters . . . | 686 | Victoria | 701 |
| NOTES ON BOOKS— | | New South Wales | 702 |
| A Doctor Held to Ransom | 686 | BOOKS RECEIVED | 702 |
| LEADING ARTICLES— | | MEDICAL APPOINTMENTS | 702 |
| The Public Health | 687 | MEDICAL APPOINTMENTS VACANT, ETC. | 702 |
| | | MEDICAL APPOINTMENTS: IMPORTANT NOTICE | 702 |
| | | DIARY FOR THE MONTH | 702 |
| | | EDITORIAL NOTICES | 702 |

THE TEACHING OF HYGIENE IN SCHOOLS.¹

By HARVEY SUTTON, O.B.E., M.D., B.S. (Melbourne),
Principal Medical Officer, Department of Public
Instruction, New South Wales.

THE teaching of hygiene in schools has received considerable attention from health authorities and in recent years has attained an importance which deserves the more serious consideration of educationists.

In 1875 the great English *Public Health Act* for the first time gave man control over his environment. This legislative triumph, however, led to further compulsory laws the experience with which have demonstrated that laws are only fully effective when supported by public opinion, for example, compulsory vaccination. With the beginning of the twentieth century came the realization of the importance of the human factor and the value of education. In the war it was incumbent on every officer and soldier to know the laws of health and sanitation and experience with Australian troops showed that education not discipline made regulations effective; the Australian reacts favourably to the rational attack from one with a first hand knowledge of his subject.

What I wish to demonstrate is the direct value to education departments, their teachers, schools and scholars of the teaching of hygiene and to suggest suitable ways of approaching the subject. The function of hygiene I take it is to protect and correct, prevent and create.

Protection.

The school stands *in loco parentis* to the scholar for about six hours a day. This personal responsibility for the pupil implies the safeguarding of life and health while he is at school.

Hygiene may add materially to the protection of the child at school. Bad postures, round shoulders, backs and spinal curves and twists are greatly influenced by unsuitable desks, improper lighting and fatigue increased by bad ventilation and unsuitable bags and one-handed games. The desk should be fitted for the pupil and should permit of proper, erect sitting posture and relief from strain. Physical training and breast-stroke swimming may protect and correct these bad postures. Teachers in class may greatly help to obtain habitual good posture. The possession of the correct erect posture and beautiful carriage should be the right of every boy and girl.

Infectious diseases with their recurrent epidemics play a serious part in reducing school attendance. As many as 91,000 patients out of 330,000 in attendance were away from school in one year in New South Wales and on an average one-fifth are away for one month each year. While the preschool age is the chief focus of these epidemics (excepting only mumps) the school counts not only in spreading but also in the control of the spread of infection. By the teaching of cleanliness and the value of the open air much may be done by the school in protecting

children from these diseases as well as by forcing on the parent the need for attention to the child when exclusion is used.

"Safety first" is just beginning to be recognized in school. The Railways Department in New South Wales provides for the issue of a coloured page in the monthly issue of the *Education Gazette*.

The rôle of accidental death and injury in boys is of serious import. Of all boys between five and fifteen years who die yearly from any cause, one in every four are killed by accident—as many as die from all the infectious diseases put together. And for everyone killed seventy to a hundred are more or less seriously injured. The figures for all children conceal this fact as the liability to accident is four to five times heavier in boys than girls.

It is significant that almost the only improvement in this death rate is that for drowning, the one item education through the teaching of swimming and life saving has tackled.

Every teacher should have a working knowledge of "first aid" so as to prevent the bad results of accidents or even to save life and a properly fitted first aid cabinet should be present in every school, while safety first deserves a regular place in the school curriculum.

Correction.

The function of the school should, secondly, be to correct failures. The whole national dietary has altered in the last half century. Australia consumes more sugar per head than any other country except New Zealand. Meat eating has diminished in recent years and only about half a pint of milk per head is consumed daily. The minimum allowance for children should be not less than a pint of milk a day. In addition, a vast amount of tinned and canned, preserved, spoiled and old food is consumed. Large cities inevitably import their food from the rest of the State, from other States or from other parts of the world. The result is that adults get along fairly well, but the growth needs of children are not properly observed. This is shown by the presence of malnutrition in school in fairly distinct amount. This means reduced resistance against disease, increased liability to fatigue and backwardness in physical and mental development and is undoubtedly mainly due to improper rather than insufficient food. The Infant Departments in Sydney have demonstrated by the milk feeding in school of over five thousand children the unique importance of milk as an essential in the dietary of children.

Closely allied to this problem of malnutrition is the prevalence of dental disease—the universal disease of civilization. Both in the early formation and later protection of the teeth the present excessively starchy diet with lack of vitamins is, as all dental authorities agree, the chief item.

In addition to teaching in regard to diet and food, the school is doing a great deal towards popularizing conservative dentistry for children, thanks to the effort both of the medical officers and of the dental clinics. Concentration is on the treatment of the teeth of school entrants. Recent figures

¹ Read at a meeting of the Australasian Association for the Advancement of Science, August, 1926.

taken in a large industrial centre show that this policy has been so far successful and that about 25% of the children when examined three years later did not require dental attention, a remarkable change from the percentages of 1% to 5% of ten years ago.

Dental disease operates in school life by causing pain and dental abscess and indigestion due to "bolting" of food and the absorption of poisonous products of teeth decay and so interferes with school attendance and directly handicaps the child in school. In the adult population it is probably responsible for a large proportion of indigestion, anæmia and muscular rheumatism which play such a large part in out-patient attendance at hospital.

The arrangement of food at meals, so as to conserve the soundness of the teeth, by the eating of wholemeal bread and by eating firm foods such as celery, apples, hard toast *et cetera* at the end of meals is of distinct value.

One of the serious problems which is much discussed in the secondary schools is the question of overpressure so-called, particularly in girls. A recent investigation extending over some years by a woman medical officer specializing in the matter showed that the essential reason why breakdowns occurred was the neglect by the girl of the simple laws of health. A long journey by train in the morning and evening meant a hurried breakfast, a scrappy lunch and an unsatisfactory dinner. The desire to excel at examinations, stimulated by both school and parents, showed itself in overwork at home, especially operating by the cutting down of the hours of sleep which in the student life should not be less than nine hours. Exercise in the open air was neglected; in fact there was a failure to live healthily for twenty-four hours a day, with the inevitable result that the nervous system and body generally broke down under the strain. The failure was in the home, not in the school and the teaching of hygiene and its practice would overcome the majority of such cases. Its educational importance then is very great.

Similar factors operated very often in the school life of teachers and in the home. The chief causes of long leave are neurasthenia, anæmia, mental depression and tuberculosis. Personal health is the chief asset of every professional person, especially the teacher and following this for some years it was evident that though the stress of teaching might be considerable; even under unsatisfactory conditions those who broke down did so nearly always because of the failure to organize their life along the lines of satisfactory hygiene as to diet, sleep, exercise *et cetera*. For successful teaching of hygiene teachers should be exemplars of the subject and in doing so would greatly add to their own protection. In correcting teachers' examination papers it is remarkable to note the prevalence of superstition and fetish with regard to the human body and its needs and this the proper teaching of hygiene would remove.

Prevention.

The third aspect is that of prevention. By this is meant the future improvement in the protection

of the general population rather than in the school itself. Two great social movements are taking place in Australia at the present day. On the one hand is the flocking to the cities or rural depopulation; on the other is the steady industrialization which still further fosters city growth. The development of secondary industries and of technical education is widely recognized as a national necessity. It is therefore wise that the dangers of these social movements should be foreseen and prevented. In New South Wales the infantile mortality of deaths in infants under one year of age follows closely the degree of industrialism of the community. In the north coast and northern tableland for the last twenty years the infantile death rate has been between forty and fifty per one thousand births or a few points only worse than New Zealand which has the best figures in the world. On the other hand the figures for the south coast and Newcastle, both with great industrial centres, are much higher than those for the north coast, running in the case of Newcastle to over 70‰. The central tableland is much worse than the northern tableland owing to the presence of Lithgow, an important industrial town, while at Broken Hill, with the climate and industrial life both combined, an unenviable infantile mortality of over 100‰—the worst in Australia—is to be found. In Broken Hill, it has been shown by the work done at the infant health centres that the death rate is twice to three times heavier among children whose mothers do not think it worth while attending the infant health centres.

The maternal mortality which, second to tuberculosis only, forms the heaviest death rate in the ages fifteen to forty-five amongst women in Australia, and which is worse in Australia and New Zealand than in Great Britain and Ireland, is again closely associated with city life and industrial conditions. In spite of the difficult conditions, the great distance and lack of school assistance which exist in the country, the city mortality of mothers in childbirth is heavier than in the country. This is undoubtedly due in part at least to the lack of personal health in the mother herself, due to neglect of hygienic conditions. The death rate in mothers of thirty-five to forty is two and a half times greater than that in mothers of twenty-five. It is difficult to imagine that apart from neglect the women of thirty-five to forty can be regarded as having impaired health. Throughout the States the trail of industrialism shows itself in this serious menace to the women and children of Australia and it is on the teaching of hygiene in schools and the preparation for motherhood which such training may give, that a campaign against these mortalities greatly depends. Even in occupational diseases the same rule may apply.

We may confidently state that the three great racial diseases or poisons are alcoholism, tuberculosis and venereal disease and our chief weapon against them is sound education.

Sex education is a problem which has not yet been solved, the consensus of opinion being that the home here plays the more important part. It is well, however, to realize that, as shown in a recent

investigation amongst high school girls in which the date of onset of puberty was carefully followed by a woman medical officer and 2,912 girls were dealt with, the mode or chief age for the beginning of puberty is between the thirteenth birthday and thirteen and a half and that 85% had passed the stage of puberty before their fourteenth birthday. It is evident that our ideas will have to be reviewed with regard to the importance of the thirteenth year of life.

Creation.

The fourth factor is the creation of health and this we regard as the most important function of hygiene. This positive idea of health, greatly aided by physical education and swimming and open air teaching, is still greatly neglected in spite of our ideal climate and progress is dependent upon the realization of the Greek ideal that an ill-trained body is as severe a criticism as illiteracy.

It will thus be seen that hygiene teaching is of direct and unusual benefit to the school and the scholar and must take a more important position.

The methods of hygiene teaching, however, are by no means agreed upon. There is no question that in the infant departments the teaching of habits and the simple laws of health with regard to cleanliness, food, sleep, exercise *et cetera* rather than mere information, must be the essential attack. Infant departments have admirably succeeded in this direction and have reinforced their work by the regular weighing of the children at the same time, on the same day in the week and once a month throughout the year. The record of weight shows the progress of the child and forms a central point of interest to both child and parent. These weighing machines were provided by the subscriptions of the parents.

Incidentally, a study of the results of monthly weighings over some hundreds of children between the ages of six and nine years has shown that growth in weight does not take place evenly throughout the year, but that in the five months between February and June inclusive the child grows five times as fast as in the later five months of the year—July to December. Five-sixths of the weight is put on in the early part of the year and at July comes a sudden break and abrupt cessation of the rate of growth. This confirms the findings of Dr. Fitts, of Auckland, published in the Science Congress held in Wellington in 1922, in which he also showed an irregularity in psychological testing corresponding to this. Tests for accuracy, concentration, memory *et cetera* revealed steady progress in the child from February to June and in the latter part from July onward yielded quite irregular findings and showed lack of progress. This would suggest that examinations are best held in June and that the methods of teaching may yet have to be modified in accordance with this remarkable finding.

In the middle and upper departments the work is not so satisfactory. Half an hour a week is given and used in many schools, but teachers find it difficult to obtain sound sources of information and the whole training of the teacher is greatly affected by the gap that occurs between science teaching

and the teaching of hygiene to so many of the high school pupils who form the recruiting ground for the teachers of the Department. Not until hygiene is continuously taught from *Kindergarten*, through primary and high school, up to and including the university, will we get the properly trained teachers that we require, and Melbourne University has set a good example in the special course of physiology and hygiene arranged there.

The essential method of instruction, however, is the use of correlation, the introduction of the idea of human welfare into every subject wherever possible. Health should be taught in association with Nature study, geography, history *et cetera* by the simple introduction of human interest into many of the lessons given.

Take a few examples to the contrary. A domestic science class was receiving an excellent lesson on the cleaning of textiles by means of oxalic acid, a deadly poison. On inquiry one found that no instruction was given either as to how poison should be kept in a proper poison bottle, properly labelled and in a locked cupboard in the house, nor was the method of treatment of accidental poisoning and the proper antidote brought before the notice of the class.

Again, nature study books give an excellent description of the life history of the fly and the mosquito without any allusion to the importance to the human being. The fly which is the most dangerous character on the landscape, and the mosquito which has been responsible for the recent great epidemic of dengue fever in New South Wales and Queensland and for malaria in Queensland and in Papua, are treated in identical fashion to harmless butterflies and beetles. One would have thought that a study of the life history would naturally lead to the practical problem of the extermination of these serious death-dealing pests.

Again, a high school boy was working up a lesson on hardness in water, a comparatively rare phenomenon in Australia, but he had been told nothing of what constituted a safe water supply for human beings or how doubtful water supplies could be made safe. Apparently the insides of boilers were more important than the insides of human beings.

Many subjects on the theory side lend themselves to definite lessons in hygiene. For example, in geography the study of the association of climate with food, climate and clothing, climate and housing, all form excellent examples of the correlation method to hygiene teaching.

Hygiene represents human welfare in its most intimate, practical and valuable aspect and not until the idea of prevention of disease and of the creation of health and of a health conscience permeates every subject in the curriculum, not until then will education carry out its full duty to the public in inculcating the ideals of health, beauty and service.

It has already been stated that continuous training in hygiene from *Kindergarten* to university is an essential part of sound educational policy, but only a few favoured individuals reach these high

standards and in considering the trail of industrialism it is well to realize that there is an increasing employment of women, particularly along the line of factory development and that with this industrialism are associated serious mortalities—infantile and maternal.

If proper knowledge of first aid, home nursing, infant management, food and diet *et cetera* which should be the automatic possession of every woman citizen and future mother, is to be successfully imparted, there is no doubt that the compulsory school age should be increased at once to sixteen and soon after to eighteen so that community health and home hygiene can be adequately taught. In the interval between the girl leaving school at fourteen till marriage at twenty-one to twenty-five as a rule a great deal of the previous teaching has been lost and the early adolescent period is the time when interest is really being thoroughly taken in these subjects.

It is important to note that in 1871 when compulsory education was introduced, 53% of the population of England were in the wage earning period and 43% in the dependent period from infancy to fifteen years of age. Compulsory education meant a great limitation of the wage earning capacity of a family, by the withdrawal of children over nine and under fourteen from the position of wage earners. According to the census of 1921 of Australia, 58% of the population of Australia are in the wage earning period and only 30% under fifteen years of age. In fact, everybody under twenty-one could be withdrawn from wage earning before the situation which was successfully met in 1871, could be reproduced. It is obvious then that the community has the power economically of raising the limit of school age. It would be of inestimable benefit to the future well-being of the community, particularly the women and children and also to males in industries as well as women. Amongst the girls it would represent training for home defence, just as boys are trained for military defence.

In other ways, too, the school by practical example can bring home lessons of hygiene. Swimming and physical training, open air lessons, cleanliness and school showers, the organization of the school lunch, milk feeding and weighing, are all practical demonstrations of the value of health and so the health may be taken from the study of the simple laws of health to more complex problems, the personal, domestic, school, civic, national and international life.

HEAD INJURIES.

By T. E. LAMBERT, M.D., M.S. (Melbourne),
Honorary Surgeon, Melbourne Hospital,
Melbourne.

THE gravity of head injuries is almost entirely dependent on the amount and situation of the damage to the intracranial nervous system and blood vessels. Even extensive injuries to the

cranium may cause very little inconvenience to the patient and this is especially common when the injury is of a localized character, though some quite extensive fissures of the skull are accompanied by few or transient signs of injury to the brain. Patients with quite transient concussion have been shown by skiagram to have fractures of the skull. For purposes of discussion we may group these conditions under three headings: (i) Conditions directly due to the injury, (ii) hæmorrhage and œdema following the original injury, (iii) infective conditions.

Under the first heading we have concussion, laceration or contusions of the brain which may be immediately under the point of impact or at the part of the brain opposite to that point. Concussion is probably due to sudden, severe compression of the whole brain by a deforming, compressing injury to the cranium. It may or may not be accompanied by lacerations of the brain tissue. If these are slight, they account for the severe bursting headaches so commonly felt by patients after recovery from even slight concussion. If numerous and severe, they cause the symptoms and signs of so-called cerebral irritation. Contusions of the brain are most commonly seen on the temporo-sphenoidal lobes and the frontal lobes either as direct or *contre coup* lesions.

Under the second heading we have, first hæmorrhage which may be either extradural or much more commonly subdural, and secondly œdema. It is most important to remember that hæmorrhage may and often does occur without any previous evidence of severe intracranial injury. Even when there is severe concussion, there is probably very little bleeding during that period of profound shock. It is only when the blood pressure rises that blood is effused in any quantity and if the bleeding is subdural, there may be an interval of days before the patient presents signs of pressure, though there is always complaint of severe headache. The onset of delirium or violent maniacal symptoms is often the first indication that something is really wrong and too many of these patients have been sent to the receiving house when a decompression operation would have restored them to health. These unfortunate mistakes usually occur in cases of subdural hæmorrhage. Bleeding from the middle meningeal artery usually comes on much more rapidly and presents the classical signs so that a correct diagnosis is made, but even in these cases acute maniacal violence may lead to the police station and death instead of the operation theatre. Then we come to œdema of the brain. Every living tissue responds to injury in the same way, namely dilatation of blood vessels, effusion of fluid and of cells and then proliferation of the connective tissue cells of the injured part. The inevitable result of these changes is to cause swelling of the affected part and this swelling exerts a damaging effect upon injured tissue proportionate to the pressure it exerts on the intrinsic cells and their minute nutrient vessels. Just as an amount of swelling that would be harmless on the dorsum of the hand, is very destructive

when confined beneath the palmar fascia, so a very moderate amount of inflammatory reaction is tremendously important when confined within the dura which for practical purposes is non-distensible or within the bony cranium. In addition we have in the cerebral cells most highly specialized tissue which is incapable of regeneration and which stands deprivation of blood supply probably worse than any other portion of the body. In my opinion the whole basis of the treatment of head injuries depends on the realization and visualization of the inevitable changes caused by the reaction of living tissue to injury and the prompt adoption of adequate means to minimize the mechanical disadvantages of that inevitable reaction. If this view is accepted, then decompressive operations must be done much more frequently and much earlier than is usual and they must be adequate. Remember the vital importance of the tissues which are being subjected to pressure. It is not sufficient to make a small dural opening in a patient suffering from cerebral laceration. How often has the cerebral cortex actually been seen to burst from the general pressure when this has been done. I admit that many of these patients recover without operation, but at what a cost! Very few of them are even approximately normal. They suffer from headache, dizziness, especially when stooping or lifting a weight, inability to concentrate on mental work and a change in their outlook on life. Too often they are classed as malingerers, especially if there is no demonstrable fracture, and deprived of their just compensation. Taking this view of the results of cerebral injury, we must try to formulate some rules which will help us to decide when operation is necessary and, if necessary, what form it shall take. First let us consider the patient brought in with severe concussion. Usually he is cold and pale with feeble pulse and respirations. Obviously the first indication is warmth, hot blankets, hot rectal injections and morphine if the patient is restless. It is wrong to expose him for neurological examinations until he recovers from the condition of shock. Even if he has some injury requiring operation, interference at this stage would most probably be fatal. If the rapid pulse and respiration are due to subtentorial pressure, operation would be useless. If and when he recovers from the stage of concussion, observation will indicate the required treatment. When scalp wounds are present the whole scalp should be shaved and cleansed preferably with "A.M.C." (acetone 40 parts, methylated spirits 60 parts, "Cyllin" 2 parts) which does away with the necessity of using soap, as the acetone cleans up the dirt and fatty material most efficiently. All scalp lacerations are cleaned, their edges excised if contused and a careful search is made for fractures and foreign material. All depressed bone must be elevated, but if the patient shows signs of much intracranial pressure, it is better to do a subtemporal decompression on the other side before elevating the depressed fragments, especially if these are over the motor areas, otherwise the general intracranial pressure may cause bursting of the cortex when the depressed bone is raised. If there

are no lacerations of the scalp, the decision as to operation must depend on the presence or absence of signs of increased intracranial pressure. Most of those usually described are terminal and operation should precede their appearance. Even after apparently slight injury to the head many patients complain of intense headache which is persistent, aggravated by movement, described as of a beating character and often felt most in the eyeballs. If lumbar puncture is done, the cerebro-spinal fluid will be found to be under greater pressure than normal and will often be bloodstained. Usually there is immediate relief of the headache, though the puncture may need to be repeated several times before the headache finally departs. Of course the adoption of ordinary measures such as complete rest in a darkened room, purgation and the use of an icecap is presupposed. If in addition to the headache there are signs of cerebral irritation, then more strenuous measures are indicated. We have two readily available signs of increasing intracranial pressure, namely increased tension of the cerebro-spinal fluid and congestion and blurring of the nasal sides of the optic discs. Rise of blood pressure is a sign of severe pressure and should not be waited for. The normal pressure of the cerebro-spinal fluid is from five to nine millimetres of mercury. After most head injuries it rises to twelve, fifteen or even twenty millimetres of mercury. Some surgeons base their decision to operate on this pressure; for example they will not undertake operation unless the pressure is fifteen millimetres or more, but there are two reasons why I do not consider adhesion to such a fixed rule sound. First, I have operated on patients when the fluid obtained by lumbar puncture was reported to be not under increased pressure, yet on opening the skull there was found much increased intradural tension. Second, the vitality of tissue and its resistance to pressure varies in different individuals, so that what in one is comparatively harmless, is in another followed by irreparable damage. It is safer to rely on the symptoms and to interpret them by the invariable rule of the reaction of living tissue to the injury. If the brain is injured either by direct injury or by pressure of a subsequent hæmorrhage, then there must be congestion and œdema and that in a non-distensible container. The relatively slight severity of cerebral symptoms seen in some patients with extensive fracture of the bony vault is probably due to tearing of the dura allowing free escape of blood and the subsequent œdematous effusion through the skull.

Taking this view of the pathology, then every patient who manifests mental irritability and confusion for more than a few hours after an injury, should be given the benefit of a free opening through the dura and it is often surprising to see the improvement following this procedure, even when it is not done until a late stage.

Let me now briefly consider the operative procedures called for by different head injuries, always premising the supreme importance of the congestion and œdema caused by the tissue reaction to injury.

In penetrating gunshot wounds there is generally a disruptive effect on the brain and the reaction to this must be provided for by free opening of the dura, preferably in the temporal region. At the same time the original wound is cleansed and bony fragments are removed. Very rarely is it advisable to search for the missile. Compound and depressed fractures of the skull must be dealt with as soon as the initial shock has lessened and in my opinion it is wise to do a decompression operation on the opposite side, when signs of severe brain injury are present. It is most important to extend the opening down to the floor of the temporal fossa. If the brain is then gently elevated with a flat spatula, a quite surprising amount of blood clot will well up or can be washed out of the middle cranial fossa. In fractured base of the skull when cerebro-spinal fluid is escaping from the ear or nose, no operation is necessary unless signs of intracranial pressure arise. Carbolic in glycerin one in ten is a reliable antiseptic for the ear and should be used freely. Patients showing signs of hæmorrhage from the middle meningeal artery are of course operated on as soon as the diagnosis is made. Then we come to that large group of patients that after a variable period of concussion present the symptoms and signs of mental irritability and confusion. This is mainly due to subdural hæmorrhage or to reactive œdema and free decompression should be done at an early stage. If there are no localizing signs, the site of election is the right temporal region and here a very free opening should be made. In cases of very great increase in tension I have opened the dura on both sides. As to choice of operation, personally I prefer the osteoplastic flap which should extend to the bottom of the temporal fossa. This can be done very rapidly by cutting the sides down through the thin temporal bone with the de Vilbis forceps and the top with an ordinary hand saw. Care should be taken to open the dura first at the bottom of the wound and then very carefully to extend the cut upward. Should the cortex then burst from the intracranial pressure it will be in the silent area of the temporo-sphenoidal lobe. The dura should be opened and reflected for 7.5 centimetres (three inches). When the scalp is sutured the intracranial pressure will lift up the flap and allow free escape of fluid under the scalp. As the pressure subsides the flap drops back into place. Most surgeons prefer craniectomy of the temporal bone to the flap method. This should always be done through a vertical and not a curved incision and the gap should be about 7.5 centimetres (three inches) in diameter with a corresponding opening in the dura. This leaves a bony defect which is undesirable, even if under the temporal muscle and will need a subsequent operation for its repair. For repair of skull defects I have found a thin, broad graft cut from the whole width of the sternum to be the most satisfactory. I first used this at No. 11 Australian General Hospital in 1916-1917.

Another class of head injury that requires operation, is that sustained at birth either from prolonged or instrumental delivery. Any patient mani-

festing evidence of cerebral irritation, prolonged screaming, twitchings or convulsions, should be subjected to a lumbar puncture and if this reveals increased pressure or if the fluid contains blood, then a decompressive operation should promptly follow.

Infective conditions following head injuries may be immediate or remote. Infected wounds and hæmatomata should be dealt with as indicated. Septic meningitis is luckily uncommon. It is well to remember that abscess following injury may be latent. Many years ago I reported a case in which fracture involving the middle fossa of the base was followed by apparently complete recovery for ten years, when symptoms of intracranial pressure developed. Decompression was followed by *hernia cerebri* and death. At autopsy a thick walled abscess was found densely adherent to the old fracture across the petrous bone. The *membrana tympani* presented no perforation or signs of inflammation.

NOTES ON THE PROBABLE LIFE OF *CERCARIA* *CATELLÆ*, AN ECHINOSTOME *CERCARIA* FROM NEW SOUTH WALES.

By BURTON BRADLEY, M.B., Ch.M. (Sydney),
D.P.H. (London),
Goulburn, New South Wales.

ALTHOUGH the description of *Cercaria catellæ* and some notes as to its relationship to certain echinostome larvæ and adult stages have appeared in the course of a previous communication,⁽¹⁾ the following account, dealing as it does more particularly with various stages of an echinostome or echinostomes found in certain birds, will be found complementary to and extending the former.

Cercaria catellæ is a characteristic echinostome type of cercaria found in *Limnæa brazieri* (Smith) and *Bullinus brazieri* (Smith). The specimens dealt with were found in the Monaro tableland district of New South Wales, Australia, at altitudes varying from two to four thousand feet. Cysts that appear to be identical with cysts actually seen to form from the above cercaria on the slide are present in large numbers in *Bullinus brazieri* and also, but less numerous, in *Limnæa brazieri*.

Young have been seen to emerge from the naturally found cysts in *Bullinus brazieri* closely similar in appearance to the tailless cercariæ. The tailless larvæ found in several water birds agree closely with the characteristics of the tailed cercariæ. Finally the adult fluke found in the "hoary-headed grebe" connect up apparently with the larvæ found in the same bird and in other birds mentioned later.

It will be necessary now to examine the whole chain of observation step by step and to discuss certain possible sources of error.

The *Cercaria* Stage (*Cercaria Catellæ*, N.Sp.).

The cercaria stage is described fully in the previously mentioned paper and the following is a

brief summary. The drawing (see Figure I, K) will enable the description to be followed.

The most prominent feature is formed by that part of the excretory system lying anterior to the posterior sucker and consisting of a somewhat sinuous tube filled with highly refractile granules. This is a very prominent structure both in the free and encysted condition. It will be seen from the drawing that this tube joins the bladder behind and near the pharynx forms a peculiar loop. I have not been able to trace further details of the excretory system in the cercaria stage, but have been able to recognize several groups of flame cells.

The intestine leads through a funnel shaped mouth through a muscular pharynx into a straight portion which bifurcates just anterior to the posterior sucker. The caeca apparently lead nearly to the posterior end of the body, but the exact termination of these, as also the positive continuity of the bladder and granule carrying tube, is difficult to make out chiefly owing to numerous granular cells in the body. The body contains many of these granular cells and a specially noticeable feature is the chain of more or less quadrilateral cells at each lateral margin. The tail is a prominent muscular organ ranging in length from 0.20 to 0.40 millimetre according to degree of extension. The body has a length varying from 0.25 to 0.30 millimetre and may extend to 0.45 millimetre or more in movement with narrowing. Width of the body in the average condition is about 0.12 millimetre. The cercaria develops in rediae and further details of these may be found in the earlier paper.

The Encysted Stage.

The cysts, showing the characteristic chain-like structure described, measuring 0.13 to 0.16 millimetre, are found in large groups of a hundred or more in *Bullinus brazieri* and less frequently in *Limnaea brazieri*. Occasionally cysts have been seen to form on the slide and these cysts appear to be identical with cysts naturally found. Also young of the same type as the cercaria have been emerging from cysts in *Bullinus brazieri*.

Two omissions in observation must be recorded here. Our notes and drawings of the emerging young that we have actually seen come out of the cysts, do not record whether or not the young had the circlet of spines characteristic of the echinostomes, secondly in the particular cysts seen to form we have no precise record as to whether spines also formed. On the other hand it is quite certain that all the naturally found cysts observed by us show a circlet of spines. As there are no spines visible in the cercaria stage, it is obviously important where trying to connect up the various possible stages firstly to see the cysts form and the spine form inside the cysts and secondly to see if the emerging young from the cysts are spined, for all other stages noted possess more or less well marked circumoral spines, as do all echinostomes.

The absence of spines in the cercaria stage has been already noted in various echinostomes.

We have recently tried to repeat the observations of cyst formation and emergence of young, but so far without success.

The failure to find in several thousands of bullinus and also in several thousand limnaea examinations any cercaria with a ring of hooklets, the close similarity of the spine-bearing cysts, the possibly spine-bearing young seen to emerge from these and the certain spine-bearing young in the birds make, however, a chain of presumptive evidence that is very strongly in favour of connexion between all four phases.

Another caution should be sounded here. It is possible that under the name

Cercaria catellæ more than one species may have been dealt with. If so, however, the difference must be extremely slight. I am principally moved to make this statement in view of the fact that there are several adult echinostomes already described in Australia whose adult distinguishing characteristics are comparatively slight. Professor Harvey Johnston who will deal with the echinostome found by me and here described partially, has already suggested to me that the larval stages in the several birds may not be stages of one type, but of two or more closely related species.

As the object of this paper is rather to record the facts observed by me and to suggest that *Cer-*

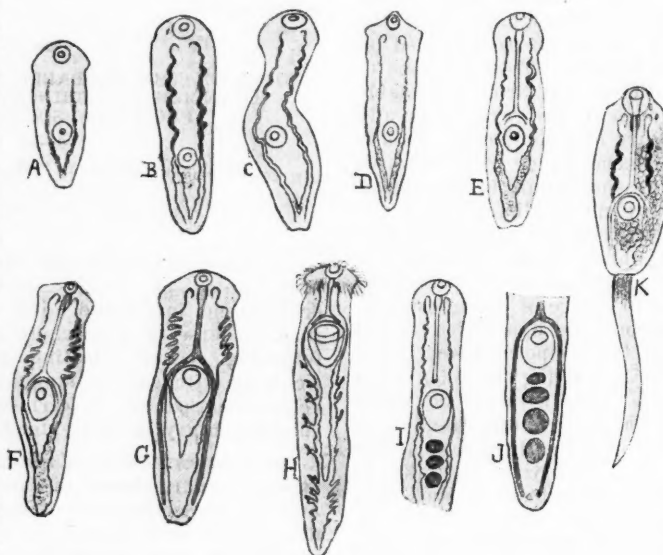


FIGURE I.

Showing Larvæ of Various Sizes from the Bowel of the Mountain Duck. These are depicted in the drawings A to J inclusive. K, representing *Cercaria catellæ* (n. sp.) is included for purposes of comparison. The sizes of the larvæ are as follows: A, 0.25 millimetre; B, 0.25 to 0.30 millimetre; C, 0.35 millimetre; D, 0.37 millimetre; E, 0.38 millimetre; F, 0.50 millimetre; G, 0.50 to 0.80 millimetre; H, 0.85 to 1.0 millimetre; K, 0.25 to 0.30 millimetre.

caria catellæ is the larval stage of an echinostome, the possible presence of two or more closely related cercariæ being for the moment grouped together as *Cercaria catellæ* or of there being in Monaro other related cercariæ hitherto not encountered by me is of less relative importance.

Tailless Young as Observed Emerging from Cysts and in Various Birds.

As stated above our records are defective in regard to the possession or not of spines in the newly emerged larvæ actually observed to come from the cysts in *Bullinus*. The general appearance, however, as shown in various rough laboratory drawings is closely similar both to the *Cercaria catellæ* and to the larval tailless young to be next described. In view of Professor Harvey Johnston's suggestion that the grebe - found adult and larvæ and the duck - found larvæ may be distinct species, I have arranged the drawings so that the larvæ from each bird are separate. The following statement shows the birds examined and the types of parasites encountered will refer also to the figures.

Ten specimens of the hoary-headed grebe (*Poliocephalus poliocephalus*) were examined.

In Number 1 two adult echinostomes were found in the gut, but no larvæ (see Figure II, L). Tapeworms were present.

In Number 2 no larvæ or adult echinostomes were found, tapeworms were present.

In Number 3 two larval echinostomes only were found (see Figure II, K). Two types of tapeworm (small and large) were present.

In Number 4 two tapeworms only were seen.

In Number 5 two types of tapeworm only were seen.

In Number 6 two types of tapeworm only were seen.

In Number 7 two types of tapeworm only were seen.

In Number 8 one tapeworm only of the small type was seen.

In Number 9 only one larval echinostome not figured (0.30 millimetre long) was seen. Tapeworms of the small type and a long, thin nematode were found.

In Number 10 two types of tapeworms were found, one small as before and the other probably not heretofore encountered. Large eggs, probably fluke eggs were seen yellow in colour and measured approximately 0.14 millimetre by 0.05 millimetre. Note the stomach contents of these grebes contained chiefly the *débris* of insects and water larvæ.

Two specimens of the little coot (*Fulica abra*) were examined.

Number 1 contained a tapeworm with four suckers and retractile rostellum.

Number 2 contained small nematodes (non-burstate). A few segments of tapeworms and a similar tapeworm to the smaller one in the grebe was found. Early echinostome larvæ (0.35 millimetre long) were seen. Stomach contents consisted of sand and insect *débris*.

In the peewhit no parasites were seen. The stomach contained vegetable *débris* (see Figure II, I).

In the mountain duck (unidentified) numerous echinostome larvæ as shown in Figure I, A to J inclusive were seen.

In the spur-winged plover tapeworms were seen. The stomach contained insect *débris* and water larvæ.

The following description of the larvæ is taken from those in the mountain duck, but the two examples from Grebe Number 3 (one of which is shown in Figure II, K) and the other examples noted in Grebe Number 9 and Coot Number 2 were of the same general type. The small number of examples from the grebe and coot, however, precludes the definite assertion of their identity with those from the duck.

Larval Echinostomes Found in the Mountain Duck.¹

The length of larval echinostomes in the mountain duck varied from approximately 0.25 millimetre to nearly 1.00 millimetre in various specimens measured and its width from 0.09 millimetre to 0.20

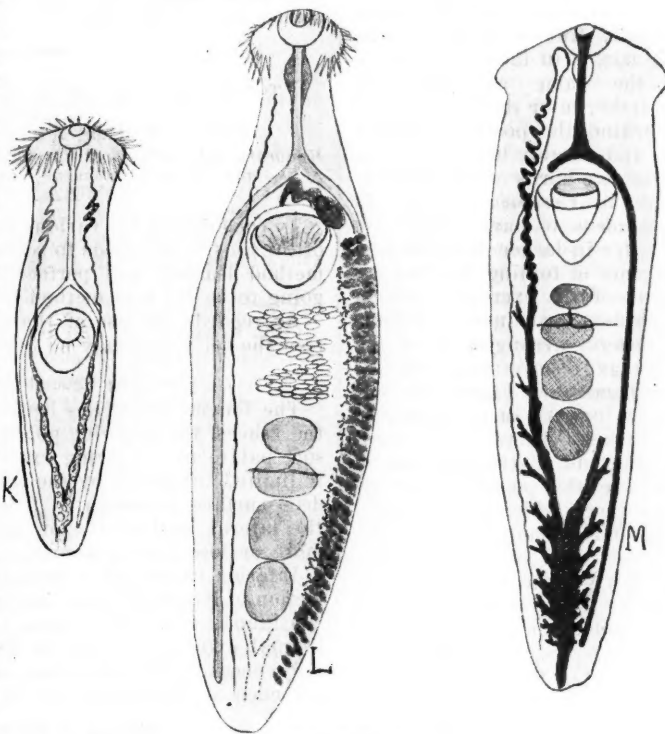


FIGURE II.

Showing K, Larva from Grebe Number III, 0.85 millimetre; L, Adult from Grebe Number I, about 12.0 millimetres; M, a diagrammatic schema of larval organs as far as has been worked out from study of larvæ and consideration of certain features in the adult.

¹ The precise scientific appellation cannot be determined.

millimetre. The shape is roughly pyriform with a blunter anterior end, showing a somewhat collar-like expansion followed posteriorly by a groove (see Figure I, A to I). There are two suckers anterior and posterior; the relative distance of the posterior sucker from the anterior varies with the size of the larvæ. In the smallest it is usually seen in the average condition of extension of the animal to lie further back than the middle of the length, but in the largest animals it is relatively much further forward, so that eventually the two suckers lie at the anterior end of the animal. This appears to be due to the greater relative growth of the posterior part of the body. Again whereas the two suckers are in the smaller example about the same size in older and larger animals, the posterior sucker is far the bigger structure. It becomes also notably cup shaped and protrudes in a proboscis-like manner when seen from the side. The excretory system, as far as has been made out, is in the earlier specimens fundamentally the same as heretofore described in *Cercaria catellæ*; later the bladder and its forward extension behind the posterior sucker become more prominent and notably branched. The chain-like extension of the two horns of the bladder, so prominent a feature in *Cercaria catellæ*, is seen in the younger specimens to have apparently identical appearance. Later in larger animals they show at times an appearance of folding, but in very large specimens this part of the excretory system becomes relatively much less prominent. I have sketched the probable general arrangement of the excretory system as far as I have been able to follow it in larger specimens (see Figure II, M). The intestinal canal opens forward in the centre of the oral or anterior sucker. There is a small pharynx which is continued as a straight tube to the region just anterior to the posterior sucker. Here it divides into two caeca which extend backwards almost to the posterior end of the body, curving round one on each side of the posterior sucker and then lying fairly close to the lateral borders. In the older larvæ there is seen posterior to the larger sucker the commencement of the genital system, consisting of two testes placed one in front of the other and in front of them again a shell gland and just posterior to the sucker an ovary. One other point to note is that there appears in some of the larger sized creatures an oblique striation in front of the posterior sucker and between the forward extension of the excretory tubes.

There was in all cases a definite ring of spines surrounding the anterior end. The actual number of spines was difficult to determine, it was probably thirty-five to thirty-seven. The spines are omitted in all drawings except Figure I, H. The two larval stages from Grebe Number 3 are both medium sized specimens, one being about 0.6 millimetre and the other about 0.85 millimetre. They show as far as can be seen the same characteristics as the same sized larvæ in the mountain duck. The larger is illustrated in Figure II, K.

The adult echinostome found in Grebe Number 1 will be more fully described by Professor Harvey Johnston to whom I have sent the specimens (two)

recovered from the bowel. At present I am content to attach the rough drawing without further comment than this. It is undoubtedly an echinostome and in its general structure closely resembles the larvæ found in other specimens of the same bird and also in the mountain duck and coot. All of these larvæ closely resemble also the tailed larvæ found in the two snails mentioned as well as the tailless larvæ seen to emerge from cysts in *Bullinus brazieri*, which cysts are apparently identical with those seen to form from *Cercaria catellæ*.

This summarizes the chain of evidence which I suggest connects *Cercaria catellæ* with an echinostome adult in one or more water birds of Monaro.

Reference.

⁽¹⁾ Burton Bradley: "Notes on Larval Trematodes from New South Wales," THE MEDICAL JOURNAL OF AUSTRALIA, October 30, 1926, page 573.

TONSILLECTOMY WITH THE GUILLOTINE.

By CLIVE M. EADIE, M.B., B.S. (Melbourne),
Honorary Medical Officer for Diseases of the Ear, Nose
and Throat, Melbourne Hospital, Melbourne.

IN considering the various methods of enucleation of the tonsils one needs to realize that the particular method learned and perfected by the operator is going to be the best method in his hands.

As regards the use of the guillotine for enucleation the following may be taken into consideration

The Faucial Tonsil.

The faucial tonsil lies between the two pillars of the fauces, the superior pole extending up into the soft palate to a varying extent. The inferior pole is limited inferiorly by the *plica triangularis*. The deep surface is separated from the musculature of the lateral wall of the oro-pharynx by a layer of more or less fibrous tissue.

Inferior to the *plica triangularis* there is a collection of lymphoid tissue extending along to become continuous with the lingual tonsil. This so-called lingual extension varies in degree of hypertrophy, only occasionally does one find any signs of the presence of infective *débris* in the shallow crypts.

Position of the Patient.

The patient should be supine on the table without any pillow.

The Guillotine.

The guillotine used is the original Heath pattern reinforced with round fenestrum and with the inferior curve of the fenestrum very narrow and with a slit between the upper and lower surfaces so that the blunt edge of the blade slides in between. There are three different sizes of the fenestrum, Number 1 is for children up to twelve years, Number 2 for those over twelve years and Number 3 for exceptionally large tonsils.

Anæsthesia.

For children under twelve years the most suitable form of anæsthetic is ethyl chloride given by the

open method and followed by ether on a mask.

For adults induction by ethyl chloride should be followed by ether given by the open method and this should be succeeded by intratracheal insufflation.

Should the catheter introduced through the mouth be found to interfere with the operation, though this has not been my experience, it may be passed first through the nose and then guided by the aid of Jackson's laryngoscope and a pair of forceps into the trachea. In dissecting out an imbedded stump of tonsil and by using a Davis gag this mode of anaesthetic prevents the likelihood of any blood clot being inhaled through the glottis.

As regards complications arising from the use of intratracheal anaesthesia, in some four hundred cases tracheitis has not occurred.

Pulmonary Abscess.

One case of pulmonary abscess has occurred. The patient was a man, aged forty-five years, with asthma who became cyanosed three-quarters of an hour after he had been returned to his bed. The anaesthetist could hardly be blamed.

Surgical Emphysema.

One case of surgical emphysema occurred in a girl of sixteen years, who gave a history of having had some indefinite signs in her lungs some years previously.

Here the emphysema was first noticed in the supraclavicular regions during the course of administration. The catheter was withdrawn. The emphysema was found to present in lesser amount in the subcutaneous tissue of the left side of the chest and left abdominal wall. It cleared up in the course of ten days.

The Operation.

Operation in Children under Twelve Years of Age.

The operator stands on the right of the patient. The oro-pharynx is cleared of mucus with swabs. A Doyen's gag is introduced on the left side of the mouth. The right tonsil is removed first. The guillotine is introduced with the extremity directed down the pharynx first to pick up the lower pole. Then it is directed towards the lateral wall of the pharynx and the tonsil is pushed through by pressure on the anterior pillar of the fauces. The blade is pressed home and the guillotine rotated so that the tonsil is peeled out of its bed from the superior pole to the inferior pole.

The left tonsil is immediately removed in the same way, the operator remaining on the right side of the patient. The child is then immediately turned on to its right side facing the operator. The adenoids may be removed with the child in this position. The operator takes charge of the head and applies iced water and as the child recovers consciousness and the bleeding eases the head of the table is raised and the throat inspected. No swabbing of the tonsillar fossa is done.

The Operation in Adults.

The patient lies supine, the head is straight with the body and the patient is under intratracheal

ether anaesthesia. A Doyen's gag is on the left side of the mouth. The oro-pharynx is cleared of mucus by swabs. Suction can be used, but is not necessary. A piece of gauze made a size suitable to fill the fossa of the tonsil that is to be removed is made ready attached to a piece of tape or catgut, also two or three gauze swabs on holders are ready. Then the right tonsil is removed and the piece of gauze put into the fossa and this is pressed in by a gauze swab on a holder. These two remain *in situ* for five minutes. Any blood that might leak into the pharynx is removed by gauze swabs on holders. An assistant can use suction to keep the pharynx free of blood if desired. At the end of five minutes the swab on the holder is taken away and the tethered piece of gauze removed and any spot that appears to be bleeding is checked by pressure with a small piece of gauze with a little peroxide of hydrogen.

Very rarely is it necessary to pick up a bleeding vessel with forceps, torsion then usually stops it. More rarely is it necessary to apply a ligature. Occasionally difficulty is found in controlling bleeding from the venous plexus towards the inferior part of the fossa. Here a suture may be put through the posterior pillar and on through the anterior pillar. A piece of gauze saturated with compound tincture of benzoin is put into the tonsillar bed and the suture tied over it bringing the pillars together over the gauze.

Should any of the lingual extension require removal it is done with a tenaculum tonsil forceps and Eve's snare or by using a small guillotine.

The left tonsil is removed in the same way, so that at the end of the operation all bleeding has ceased.

Reactionary bleeding two or three hours after operation and secondary hæmorrhage are rare.

Conclusion.

It would seem that the guillotine method is certainly the simplest and safest for children. The time of the operation is shorter than that taken to dissect them out and blood is not allowed to collect in the pharynx.

Pooling of blood in the nasopharynx cannot be too strongly deprecated on account of the risk of infecting the middle ear *via* the Eustachian tubes and the sphenoidal sinuses.

For adults it appears to be a clean, safe and effective method of enucleating tonsils.

THE HOSPITAL QUESTION IN VICTORIA.

By DAVID D. BROWNE, M.B., B.S. (Melbourne),
Wangaratta, Victoria.

THE addresses of Dr. A. E. Brown appearing in the issues of THE MEDICAL JOURNAL OF AUSTRALIA of October 9, 1926, and February 26, 1927, have been read by me with the greatest interest. His remark that "the present position of the charitable principle in relation to hospital maintenance and medical services is anomalous, absurd and inefficient" will not be contradicted by anyone with

experience of country hospitals in Victoria. The position is in fact becoming almost intolerable.

This is well shown by the state of affairs in Wangaratta, a prosperous country town of North-Eastern Victoria, with a population of five thousand in the midst of a well settled district with a population estimated at five thousand more.

There is a public hospital, there are five small private hospitals, but no infectious diseases hospital exists. Four of the five practitioners in the town are honorary medical officers to the public hospital.

In the twelve months ended June 30, 1926, there were 726 in-patients exclusive of patients with infectious disease treated at the public hospital. Maternity cases are not admitted. These paid a total of £605 to the hospital and as their average stay in hospital was 21.6 days, the cost averaged ninepence per head per day or five shillings and three pence per week.

During the same period there were 470 patients treated at private hospitals exclusive of maternity patients and those suffering from infectious disease. The average private hospital fee is four guineas per week. At the same time no less than 666 out-patients were treated at the public hospital at a cost to the hospital of £200.

It might be thought that the public hospital draws patients from a larger radius than the private hospitals and therefore concentrates the poor of a very large district in one place. That this is not so is shown in contrast with Benalla which has a population of about three thousand five hundred with as many more round about. But Benalla, with no public hospital and less than an hour's journey from Wangaratta by rail and road, accounts for only 38 of those 726. Of the remaining 688, 90 come from districts which have small private hospitals, leaving 596 coming from the same area as is served by Wangaratta private hospitals.

Thus the ratio of public hospital patients to private hospital patients in this prosperous part of a country remarkable for its even distribution of wealth is as follows: Five hundred and ninety-six public hospital patients are paying five shillings and three pence per week for hospital services and are receiving medical and surgical treatment free of charge. Four hundred and seventy private hospital patients are paying four guineas per week and doctors' fees.

The cost per patient in the public hospital is slightly over two pounds per week of which the patient pays five shillings and three pence and the community the rest. The attitude of mind of the average public hospital patient is that he is doing very well to pay the hospital anything at all and quite often feels entitled to special privileges because of it.

A hospital system which engenders such a state of mind in a community, which imposes so large and unnecessary a financial burden on the public and the treasury, which competes so heavily and unfairly with private hospitals and which demands that the practitioner must do so large a proportion of his work for nothing, including 50% of all major operations, is indeed intolerable. Yet such is the

system which at present exists and which the general public expects the medical profession to support as enthusiastically in the future as in the past, when the charitable principle was not so greatly imposed upon.

Yet I agree with Dr. Brown's contention that its effect on the income of the practitioner, grossly unjust as it is, would not and need not be made the basis of the needed change. Increased efficiency and service to the community in both the professional and financial aspects should be the aim. As he points out it is deplorable and may be calamitous as regards the relation of the medical profession to the general public, if impending changes are brought about without the enthusiastic cooperation of the medical profession. I would like to see the lead coming from the medical profession itself through the medium of the Victorian Branch of the British Medical Association, instead of from outside bodies who begin by wondering "how the B.M.A. will take it."

It is largely a matter of speculation as to what will be the actual effect of adding intermediate wards or provision for intermediate patients to public hospitals in the country. There is some reason to think that it may be very far from the result expected or desired.

It is more than possible that simply adding intermediate wards to existing public hospitals in the country will lead to a great falling off in public subscriptions. Already the attitude is that the general public pay for the hospitals and patients are therefore entitled to free care and treatment. When these patients are charged intermediate fees, the public will expect the hospital to be self-supporting, as indeed it should be, or very nearly so.

On other grounds also the assumption that the provision of such wards will lead to a great improvement in hospital finance is likely to prove fallacious. To achieve that there will need to be, it is supposed, a fee of three guineas per week and a goodly number to pay it. But who will pay it? Not many of those 726 who now so complacently enjoy so many privileges for five shillings and three pence per week. And not many of those 470 who prefer the quietness and seclusion and more individual nursing attention, mostly with a room to themselves, in private hospitals for four guineas per week. These hospitals are already in essence, intermediate hospitals. Moreover, private hospitals may be expected to respond to the extra competition by offering other inducements if not smaller fees. Yet the community hospital is desirable on overwhelming grounds from the viewpoint of efficiency. For this reason the general tendency to use the public hospitals should not be checked, but encouraged, as all agree. How can it be encouraged without adding overwhelming burdens to hospital finance and the free services of the medical profession?

To my mind the mere addition of intermediate wards to existing public hospitals will fail both on the score of finance and efficiency because it is a tinkering job. It does not go nearly far enough.

There will be considerable initial expense, increased maintenance and interest charges and no guarantee whatever that more than a handful of patients, willing to pay, say, three guineas a week, will occupy them.

Surely the solution of the problem lies in the open hospital advocated by Dr. Brown, open to all comers, giving all the privileges of a private hospital to all and administered with emphasis on a definite scale of fees. The perversion of the charitable principle which is responsible for the present ridiculous state of affairs, will need complete and courageous revision to meet present day conditions. The onus should be on the patient to show why he should not conform with this accepted scale of fees, a sliding scale, demanding nothing of the genuinely poor who would be, as hitherto, treated free of charge. At present in actual practice the onus appears to be on the hospital authorities to show cause why a patient should be asked for anything at all towards his upkeep—usually an apologetic sort of appeal to contribute a few shillings to hospital expenses.

In other words let us have intermediate hospitals with some free beds instead of free hospitals with a few paying beds. This, I believe, is perfectly feasible in country towns. Of the metropolis I am not qualified to speak.

It is interesting to envisage such a hospital system, administered on this principle and to attempt to forecast some of its effects.

In the first place the hospital must provide comfort and facilities as good as those obtainable in private hospitals at present. Otherwise it will not attract the patients desired. This means a heavier initial cost than the mere provision of a few intermediate beds in the present public hospitals. But it very largely solves the question of maintenance which is the real problem for the beds would be occupied by paying patients. In the long run it would mean a cessation of those endless appeals to the general public for large sums of money in the name of "sweet charity," appeals which under the present system amount to extracting money from the charitably minded under false pretences.

For the community there would be the most efficient hospital service possible to attain at fees such as rule in the large intermediate hospitals at present in existence in Melbourne.

The effect on private hospitals in the larger country towns where the new system operated, would be their disappearance. The effect on the medical practitioner would be relief from the necessity of making all his income from about 50% of his patients instead of from about 90% of them and this could very well lead to a revision in a downward direction of the standard scale of fees of the Branch.

This scale of fees is honoured, I suspect, more in the breach than the observance throughout the country and perhaps also in other places. Otherwise, it is quite certain that a still larger proportion of patients would use the public hospitals and pay no fee at all.

By adoption of the principle that all patients in hospital except the genuinely poor are expected to pay a fee and by giving the practitioner the right to decide whom he shall and shall not charge, a scale of fees could be drawn up more in accord with the paying ability of the average person. This would be a blessing to the patient, indirectly a help to the hospital and not a disadvantage either to the dignity or the income of the medical practitioner.

SUICIDE.

By W. A. T. LIND, M.B., B.S. (Melbourne),
Pathologist, Victorian Lunacy Department.

A CABLEGRAM in the daily paper (Melbourne *Argus*, February 28, 1927) recently recorded a wave of suicide sweeping throughout the Argentine. Only one method of suicide (poison) is being used and the victims are of all ages and classes. This epidemic of suicides with a certain fashion in the manner of execution may be seen in any country from time to time and is without doubt due to suggestion. Mercier in "Crime and Criminals" mentions a similar epidemic amongst the female population in Edinburgh about the sixteenth century which was stopped by the authorities threatening to expose the nude bodies of the deceased in the market place.

It is a crime in English law to attempt to commit suicide, unless the person be proved to be of unsound mind at the time. In the days of George IV suicides were deprived of the rites of Christian burial and their bodies used to be buried where four roads met with a stake driven through the coffin lid, but a more recent act has allowed the bodies of suicides to be buried in cemeteries.

In ancient Japan suicide was honourable, *hara-kiri* being the resort of the person suffering from a slight that could not be avenged. In India until recent years *suttee* or self-immolation on the funeral pyre of her deceased husband was regarded as the only correct thing for a wife to do under the circumstances.

Suicide was not a crime in Roman law, nor is it a crime in those countries which derived their law from Rome, such as in France. The reason why suicide is a crime in English law is because in olden days there were two courts in England, the one being the ecclesiastical and the other the civil. The bishops tried all ecclesiastical offences or sins, such as adultery and suicide and the judge tried all crimes and civil offences. When the ecclesiastical court was done away with, suicide was taken over as a civil offence. The objection that the Church had to the suicide was that he thereby deprived himself of that life which had been given to him by his Maker to be used for the glory of his Maker. From a State point of view the only harm a suicide could do would be by depriving the State of his services for defence when man power was deficient. Mercier considered that the suicide is to

blame civilly "if and when by his suicide he evades obligations to the State or to individual members of the State."

At first view the understanding of suicide appears simple, but to decide how much insanity comes into the question is not so easy as it seems to be. Ask the man in the street if the person who commits suicide is sane or insane and he will nearly always answer insane. Ask him what he thinks of the mental state of the soldier who acts upon Kipling's advice:

When you're wounded and left on Afghanistan's plains
And the women come out to cut up what remains,
Just roll to your rifle and blow out your brains,
An' go to your Gawd like a soldier.

The man in the street will answer that the soldier under those conditions would be sane.

It has long been accepted that "love of life and efforts to prolong it" is the strongest instinct in man and animals or as it is sometimes put, "self-preservation is the first law of Nature." There are also other instincts such as the sex instinct, the maternal defence of the young, the instinct to eat and drink and the instinct to energize; perversion of any of these instincts is detrimental to the survival of the race concerned. All animals are governed by their instincts so that when danger comes, they seek safety in flight or concealment, unless they consider their opponent equal or inferior. If they did not do so, they would perish. In ordinary circumstances the flight from danger is man's natural act, unless he feels that he has adequate means of defence in his weapons. It has, therefore, been argued that to seek self-destruction is a contravention of a natural instinct and therefore an insane act.

Now animals and idiots do not commit suicide, although the higher grade imbeciles may threaten to do so. (During the twenty years of association with the Victorian Lunacy Department I have not known of an idiot committing suicide.) The suicide, therefore, is an individual who has a higher grade of mental development than the animals and the idiot and this higher control and power of reasoning enables him on occasions to place instincts secondary to any benefits which he considers (rightly or wrongly) he can obtain by disregarding these instincts. For example, Saul, of Israel, fleeing from the Philistines asked his armour-bearer to kill him "lest these uncircumcised come and mock me." As the armour-bearer declined to do so, Saul fell upon his sword and thus obtained the benefit of avoiding a hurt to his pride which as a king would be "as gall and wormwood." Kipling's soldier would obtain the benefit of a quick, painless death from his rifle, as compared with morcellation at the hands of the Afghan women. The bankrupt financier who has just seen the collapse of all his fortune and the betrayed girl are faced by what is to them at the moment worse than death, and they look upon death as a benefit and a way out. The threat of having their nude bodies exposed put a stop to the Edinburgh suicide epidemic, because

the ladies concerned valued their modesty more than their desire to be dead.

How is a sane suicide to be distinguished from an insane suicide? If the person be known to be insane, the answer to that question is obvious, but in the absence of such information the opinion must depend upon evidence concerning his conduct immediately preceding the act. Conduct in this sense includes appearance, speech and actions. As the standard of conduct varies in different parts of the world, individuals must be judged by the standard of the country, race, sex, religion, education *et cetera* to which they belong. The cause of any departure from this standard must therefore be carefully examined. The result of the examination will disclose whether the conduct is rational or irrational. Should the cause of the departure from the ordinary standard of appearance, speech and actions be satisfactorily explained, insanity may be excluded. For example, a man may wager to accomplish some hare-brained enterprise and have a fatal accident in so doing. On the contrary, if the explanation indicates an irrational motive, insanity may be diagnosed. If a person previous to the act of suicide had voiced delusions of persecution, acknowledged impulses to kill himself or expressed the opinion that he was not fit to live, at the same time being unable to give sound reasons for saying so, then that person may be judged an insane suicide. When, however, there is no indication of insanity being present prior to the act, the decision as to whether the individual was sane or insane must depend upon what is known about the motive for the act. In the sane suicide the motive is to secure what can be acknowledged by sane reasoning to be a benefit. In the insane suicide there is often no motive apparent, but, if present, any benefit expected is the result of insane reasoning.

Different individuals have varied opinions as to whether life is worth living or not under altered circumstances. One abandoned girl suicides rather than face shame, while another adopts the life of easy virtue as soon as she had recovered from the effects of her first lapse. One man goes "broke" and suicides, while another files his schedule and then commences to look around the big shops for further purchases. Just as the Western mind finds it difficult to follow the feeling which prompts the Japanese nobleman to commit *hari kari* for his honour's sake or just as the ploughman cannot understand why the captain who has piled his craft on a reef chooses to go down with his ship, so is it with the onlooker who tries to follow the line of reasoning that assesses the respective values of the benefit of death or life with shame, misery and those unhappinesses that prompt suicide.

In the case of the old man who has lost all his money, who has no relatives to assist him and who has a horror at the thought of having to accept charity, the following is quite sane reasoning. "I have lost all my money, so that life will be perfect misery. I will therefore end my life." There is no

evidence of insanity in that. Supposing the information that he had lost all his money was incorrect, being due to a mistake on the part of a clerk. His reasoning and subsequent action would still be quite sane. Suppose the premise that he had lost all his money was an insane delusion, that is "a false belief persisting in spite of proof to the contrary." The subsequent suicide would be an insane act. Supposing the old man had lost his own money, but his sons and daughters were able and willing to provide for him. Suicide under those conditions would be an insane act, because it would be irrational for him to think that death in this case would be a benefit to him.

These examples show that sane reasoning must be based upon correct reasoning from correct premises or from premises incorrect through ignorance and that insane reasoning must be incorrect reasoning from correct premises or correct reasoning from insane premises.

It might be said that, if the abandoned girl were tidied over her period of shame, she would get over the desire of suicide because, unlike sensations, the affections such as grief, joy, sorrow *et cetera* when attention is drawn towards them, rapidly fade away and lose their intensity and the girl would soon alter her opinion and realize that life offered her more benefits than are to be found in death. The reply to this is that many suicides are no doubt prevented by the arrival of timely interruption and help. Neither Saul nor Cleopatra would have suicided if someone had come to their assistance with reinforcements. No assistance but only resistance will prevent an insane suicide.

In some forms of insanity impulses to commit suicide are the cause of self-destruction, the patient possessing a tendency to react immediately to the thought of self-destruction. Thus, if an individual is looking at the means to suicide, such as a window cord, the thought that the cord would be a suitable means for suicide would be immediately followed by the act itself.

Some persons suffering from mania may accidentally suicide through defying the risks to life when doing some dangerous feat which is prompted by their exaltation.

Locke said that the simple delusional and melancholics are among the class who reason rightly from wrong premises. In this way they may reason out the meaning that they should destroy themselves. Some insane receive auditory hallucinations telling them to destroy themselves and obey the hallucinations.

In many cases there is no evidence to show why the patient suicided and the coroner simply states "there is no evidence to show the state of the patient's mind at the time."

Bibliography.

- David Watson Rennie: "Outline of the English Constitution."
Charles Mercier: "Crime and Criminals."
Clouston: "Mental Diseases."

Reports of Cases.

RHEUMATOID ARTHRITIS TREATED AT PARALANA HOT SPRINGS, SOUTH AUSTRALIA.

By C. C. FENTON, M.B., B.S., B.Sc. (Melbourne),
Paralana, South Australia.

THE Paralana hot springs are situated in the Flinders range, about five hundred miles north of Adelaide and are being developed by the Australian Radium Corporation, Melbourne. It was decided early in 1926 to make a practical test of the efficacy of the waters in the treatment of rheumatic diseases and a temporary camp was established there early in June.

The climate which is subtropical, is eminently suitable for the treatment of such conditions. The winter may be described as ideal; the days are warm and sunny and the nights are invariably mild, frosts being unknown. In the summer the heat is mitigated by refreshing breezes and cool nights. The remarkable dryness of the atmosphere is an important feature.

The spring water emerges at a temperature of 62.2° C. (144° F.) and contains mainly sulphates and carbonates of sodium, potassium, calcium and magnesium. In addition its proximity to the rich Mount Painter radium mine led to the belief that radium emanations might possibly be present in the gas which bubbles up with the water at its source. This view was confirmed and during our stay there the gas was tested and proved to be highly radioactive.

An open-air bath was excavated close to the spring and the water flowed continuously through this bath which maintained a constant temperature of 38.9° to 40° C. (102° to 104° F.). Patients bathed here once daily for twenty minutes and immediately afterwards spent half an hour resting in bed between blankets. In addition, when practicable, joints such as wrists or ankles were bathed for varying periods where the water registered 44.4° C. (112° F.). Patients with affected hip joints had a hot hip bath once daily for ten minutes at 44.4° C. There were no facilities for the carrying out of efficient massage. Patients were encouraged, as far as possible, to massage their own joints while bathing.

In addition all patients drank at least one and a quarter litres (two pints) of hot spring water daily. A definite routine was arranged and regular hours for sleep, meals, baths and recreation insisted upon. Graduated exercise was encouraged. No attempt was made to diet any of the patients.

Male patients only were provided for and they were accepted only after furnishing references from the medical advisers who were subsequently asked to report on any progress noted. Unfortunately, however, only three of these responded; their observations are included in this report.

Clinical Histories.

In the five months during which the camp was maintained, eleven patients with rheumatoid arthritis and one with gout were treated at the springs. Of these twelve patients three showed no appreciable improvement after six weeks' treatment. The following are details of the remaining nine cases:

CASE I.—F.M., aged forty-two years, had suffered from rheumatoid arthritis in the knees for sixteen years. His medical advisor had been Dr. G. C. H. Nicol, of Walkerie, South Australia. Two and a half years ago both ankles became affected. He had tried various forms of treatment without obtaining much relief. On examination his knees were found to be extensively involved and the movement was restricted. Tenderness, grating and effusion of synovial fluid were present. The right ankle was fusiform, but contained no fluid. Extensive synovial and peri-articular thickening were present. Dorsiflexion and extension were somewhat restricted. The foot was permanently everted about 15° to 20°. Efforts at inversion caused great pain. The condition of the left ankle was similar and the foot was everted from 10° to 15°.

After five weeks' treatment there was no tenderness in the knees and there were no signs of fluid in the joint. The range of movement was about the same. The thickening in the right ankle had diminished. Flexion and extension were practically normal and inversion was possible without the production of pain. All movements were painless and much more free. The same degree of improvement was apparent in the left ankle. The patient's weight had increased from 56.7 kilograms (nine stone) to 60 kilograms (nine stone seven and a half pounds) in spite of the fact that he had sweated profusely every day. The following report was received from Dr. Nicol:

Since returning from the springs he has been much more free from pain than formerly. There is no improvement in the range of the knee joints, but the ankle movements are much better, particularly the lateral movements. I should think the improvement would be only temporary and that if he visits the springs annually (as is done with Continental spas) it would help materially to check the progress of the disease.

CASE II.—C.C., aged thirty-five years, had suffered from rheumatic fever at the age of twenty-seven. He had suffered from rheumatoid arthritis for eighteen months, fingers, ankles, toes, shoulders and wrists being involved. Several septic foci were removed (tonsils and teeth). Slight improvement followed. Among the methods of treatment tried without any result were the administration of thyroloid extract, permanganate, collosol sulphur, collosol iodine and electrical therapy. On examination swelling and fluid were present in the wrist joints. Movement was very restricted and was accompanied by creaking and pain. Extensive periarticular swelling and restriction of movement were present in the fingers. The right big toe was swollen and thickened and creaking was manifested at the metatarso-phalangeal joint. Extension was painful and restricted. The left great toe was swollen and tender at the metatarso-phalangeal joint.

After five weeks treatment pain, swelling and tenderness had disappeared from the wrist joint and the range of movement had increased. No improvement was manifested in the movement of the fingers, but swelling and tenderness had diminished to a considerable extent. Swelling was absent from the right great toe, thickening had diminished and neither pain nor restriction of movement was present. The condition of the left great toe was similar. The patient could walk easily and without the acute discomfort previously experienced. His general health was much improved and his weight had increased in three weeks from 64.6 kilograms (ten stone eight pounds) to 67.2 kilograms (eleven stone two pounds).

CASE III.—M.S., aged forty-eight years, had suffered from gout for twelve years. Pain and swelling had first attacked the big toe of each foot, later spreading to the ankles, knees, right wrist and right elbow. For the last two years the right wrist and the dorsum of both feet had been almost continuously affected. Sometimes he had been confined to bed for three or four months out of the year; at these times he could not walk and pain was too severe to permit sleep. The patient gave a history of heavy beer drinking. On examination extensive periarticular swelling was present around the right wrist joint. Considerable tenderness was present over the ulnar articulation. Extensive limitation of movement was present. Some thickening was present around the right ankle joint and the dorsum of the foot and the movement of the left ankle was somewhat restricted, thickening being present along the dorsum and also pain in extreme extension.

After four weeks' treatment no pain, tenderness or thickening was present in the ankle. The right wrist joint was practically normal, movement being only slightly impaired.

CASE IV.—T.H., aged seventy years, had suffered from rheumatoid arthritis in the left wrist for seven years. His condition had gradually become worse. Pain, swelling and limitation of movement were present. He could not close his fist and was unable to cut his meat at table, his hand was almost useless. On examination some bony

swelling was found near the carpo-metacarpal joint on the dorsum of the wrist. Some periarticular swelling of the soft structures was also present. The wrist could not be dorsiflexed beyond the line of the forearm. Flexion was limited to about 30°. The range of adduction and abduction was about 35% of normal. Forcible flexion was painless and efforts at extension caused pain near the end of the radius. Creaking was present. Hypertrophy of the head of the metacarpal was noted, as well as tenderness to pressure over the articular margin of the radius.

After four and a half weeks' treatment the fist could be completely closed with ease. Abduction and adduction were 70% of normal and flexion covered a range of about 60°. The range of extension was 10°. Swelling was absent. There was practically no pain or tenderness. The patient could perform ordinary actions with comfort.

CASE V.—A.T., aged twenty-five years, had suffered from rheumatoid arthritis of both ankles for four years. The instep of both feet was affected. For the last three months his right shoulder had become increasingly painful and stiff. On examination tenderness to pressure was present over the neck of the right humerus. In attempting flexion the patient could not raise his arm above 105° and in abduction he could not raise it above 75°. Other movements were not limited, but were all accompanied by pain and stiffness. The arch of the right foot was almost completely flattened, the cuboid bone protruding medially. The plantar aspect of the arch was very painful and tender. No movements were restricted, but all elicited pain in the region of the prolapsed cuboid bone. The condition of the left foot was similar to that of the right. The patient found walking exceedingly painful. After nine weeks' treatment tenderness was still present in the right shoulder. Flexion was possible through an angle of 125° and abduction through an angle of 90°. The movements were much more free from pain. No pain or tenderness was present anywhere in the right ankle and foot, all movements were painless. On examination of the left ankle and foot pain was produced on pressure just below the medial malleolus. Forcible inversion also caused some pain here; all other movements were painless. Walking is now unattended by the former pain and discomfort.

CASE VI.—W.M., aged sixty-two years, gave a history of rheumatoid arthritis in both hips for twelve years. About six years ago movements became restricted and this gradually became worse. At times his left knee, left ankle and right shoulder had also been attacked, but no permanent damage had resulted. On examination the right hip could be flexed and extended through an angle of 90° and could be abducted and adducted through an angle of about 45°. Some tenderness was present around the joint and in the groin. Creaking was noticed. The condition of the left hip was similar.

After thirteen weeks' treatment all tenderness disappeared. The patient was much more agile. The movements were not altered much, except that the range of flexion and extension was extended by about 20° in both hips.

CASE VII.—M.R., aged sixty-three years, was invalided home from the war eight years ago after contracting rheumatic fever. Since then he has suffered from gradually increasing swelling, pain and stiffness of both hips. On examination there is some evidence of myocarditis. Flexion of the right hip is limited to about 90° and attempts to increase this cause acute pain. Flexion of the left hip is possible through a range of 105°. It was possible to separate the malleoli for a distance of only 27.5 centimetres (eleven inches). No rotation of the hip joint was possible. Examination of the spine revealed stiffness, pain and restricted movement in the lumbar region.

After six weeks' treatment flexion of the right hip was possible through 105° and of the left hip through 130°. The maximum distance between two malleoli had increased to 45.5 centimetres (nineteen inches). Adduction of both hips was possible through 35° and rotation through 10°. There was no change in the condition of the spine. The patient was much more active and practically free from his rheumatic pains.

CASE VIII.—The patient, aged fifty-one years, gave a history of rheumatoid arthritis extending over twelve years. He was a patient of Dr. A. Sandison, of Woodville, South Australia. On examination movements of the neck were limited in all directions. Flexion and abduction of the shoulder were limited to 90°. External rotation was very limited in the right shoulder. All movements of the left wrist were somewhat restricted. In the left hand considerable tenderness and swelling were present over the metacarpophalangeal and the first interphalangeal joints of all digits except the thumb. Considerable limitation of flexion of all these joints was present. The grip was weak. It was quite impossible for the patient to clench his fist. The condition of the right wrist and hand was somewhat similar. Creaking on movement and some lipping of the bony surfaces were present in the knee joints. Extreme flexion caused acute pain. Pain and stiffness were present in the knee joints when the patient rose from a sitting to an erect posture. Movements of the spine were restricted in all directions. The patient was in a helpless condition and was unable to dress himself.

After nine weeks' treatment no appreciable improvement had occurred in the neck and spine. The shoulders manifested some slight improvement, the muscular tone was better and external rotation at the right shoulder was normal. No pain occurred in the knees when the patient assumed an erect posture, but stiffness was still present. The movements of the wrist joint had definitely improved. All tenderness had disappeared from the left hand and the swellings were much reduced. The index and middle fingers had improved their range of movement by about 60% and the ring and little fingers had about 80% more power in the grip. No tenderness or swelling of the joints of the right hand was present. The movement of the index and middle fingers had improved by about 75% and that of the ring and little fingers by 95%. The first could very nearly be closed and there was much greater power in the grip.

Dr. Sandison reported as follows:

There is a considerable improvement in the range of movement of nearly all of his joints and there is also a diminution of tenderness; considering the severity of the condition I should say that the treatment at the springs has proved satisfactory.

CASE IX.—A.R., aged forty years, gave a history of arthritis of hips, knees and elbows extending over ten years. He was a patient of Dr. C. E. C. Wilson, of Kadina, South Australia. Six months ago the knees became very painful. Movement became limited and the patient was forced to take to crutches. On examination some bony deformity was seen around the elbow joints. Flexion, extension and supination were permanently limited. No pain or tenderness was present. Flexion and extension of the left hip was possible through an angle of only 30° to 45°. No abduction or adduction was possible. No rotation could be carried out. Movements caused pain and there was some tenderness in the groin. Flexion of the right hip was limited to 90° and other movements were slight. Flexion of the right knee joint was limited. There was a huge bony hypertrophy on the medial aspect of the femur. The joint was fusiform and a large gap was palpable laterally between the articular surfaces, pronounced lipping was present. The condition of the left knee joint was similar. The patient suffered considerably from rheumatic pains which disturbed his sleep at night.

After four and half weeks' treatment flexion and extension of the left hip could be carried out through a range of 30° to 80°. Some slight movement of abduction and rotation could be performed. In the right hip flexion was possible to about 110° and rotation and abduction had improved. The movement of the right knee was unchanged, but improvement had occurred in the left. Pain and tenderness had diminished to a considerable extent. The patient's sleep was no longer disturbed at night and he was able to move about with greater freedom.

Dr. Wilson reported as follows:

I am pleased to report that Mr. A.R., of this town, who has been suffering from *osteoarthritis deformans* for many years, has improved very considerably by his treatment at the Paralana hot springs. I find that

he can use his joints and muscles very much more than formerly and has been able to dispense with one of his crutches, whereas formerly he had to use both. . . .

Conclusions.

To sum up, the conclusions to be drawn from observation of the above patients may be stated as follows:

1. The water of the springs seems to possess the power of diminishing pain, tenderness and swelling in joints afflicted with rheumatism.

2. Improvement in the range of movement of an affected joint depends mainly on two factors: (a) the length of time the joint has been affected, the prognosis being better the more recent the onset, (b) the efficiency of the massage employed. The latter is considered to be an important factor and much better results should be obtained at Paralana when ample provision is made in this respect.

3. The majority of patients show definite and encouraging improvement in general health, as indicated by better sleep, keener appetites, increase of mental and physical energy and gain in weight, the latter despite heavy daily sweats consequent upon the warm baths. It is difficult, however, to state whether this fact is due to the balneotherapy alone or to the climate and regular, open-air life. In all probability both factors play their part.

BILATERAL MELANOTIC GROWTH OF SUPRARENAL GLAND.

By R. M. SMITH, M.B., B.S. (Melbourne),
Resident Medical Officer,
Brisbane Hospital.

Clinical History.

F.D., aged sixty-four years, was admitted to hospital on November 15, 1926, complaining of abdominal pain, vomiting and loss of weight and energy for one month. He had suffered from no serious illnesses in the past and was apparently quite well until one month ago, when he commenced vomiting after the intake of food, even fluids, followed later by vomiting independent of food. This vomiting settled down somewhat, but at times he could retain nothing whatever. He did not vomit large quantities of fluid or undigested food. Pain was present in the region of the navel and came on immediately after the ingestion of food. In the month he had lost 9.4 kilograms (twenty-one pounds) in weight. For four to five days prior to his admission to hospital he passed tarry stools, but at no time did he vomit or cough up any blood. He had never been jaundiced. There was no history of venereal disease. Further questioning revealed nothing of value.

On examination the patient looked anæmic and had obviously lost a fair amount of weight. Both legs were slightly oedematous; there was no evidence of jaundice. Heart and lungs manifested no abnormality. Abdominal examination revealed no enlargement of the liver or spleen and no tumour was palpable. He pointed to a spot a little to the left of the umbilicus as the site of his pain. There was no dulness in the flanks and nothing abnormal was found on rectal examination. The urine was clear.

A provisional diagnosis of carcinoma of the stomach was made. A fractional test meal was done. In the resting juice there were 39.5% combined acid and 21% free acid; no lactic acid or blood were found. Throughout the test meal combined acid varied within normal limits, there was no free hydrochloric acid, lactic acid was present in all specimens, no blood was detected and bile was present in all specimens.

A blood count yielded the following result: Red cells 850,000 per cubic millimetre, white cells 7,200 per cubic millimetre, hæmoglobin value 27%, colour index 0.76. No nucleated forms were seen.

No reaction was obtained to the Wassermann test.

A bismuth meal and X ray examination revealed rapid passage through the pylorus; the pylorus was long and tapering and slightly irregular and it was thought that probably a new growth of the pylorus was present.

An exploratory laparotomy was intended, but the patient did not improve sufficiently to allow an operation to be performed. On November 30, 1926, he complained of severe abdominal pain and vomited a great deal after and independently of food. Morphine was used to give relief with cessation of the vomiting. The pain was quite vague and became less severe, but his condition did not improve and he died on December 19, 1926.

Post Mortem Notes.

A *post mortem* examination was done. The abdomen, when opened, was full of very purulent fluid, offensive in smell and studded through that part of the small intestine which was visible, were many black masses, varying in size from 0.6 to 3.75 centimetres (one-quarter to one and a half inches) across. These were in the wall of the intestine through the upper half of the small intestine, with corresponding enlargement and bluish-black discoloration of the mesenteric glands. Through one of the large infiltrations in the gut wall a small perforation had occurred, the rest of the infiltration was quite firm. There were two intussusceptions in the small bowel. The stomach, duodenum, ileum and large intestine looked normal. The liver was not enlarged, was slightly tougher than normal, but did not show any secondary deposits on section. The spleen was enlarged and of bluish-black colour. On each side in the suprarenal region attached to the kidney, but quite separate therefrom, was a bluish-black soft tumour some ten centimetres (four inches) in diameter. This readily shelled out. On section it was full of black disintegrated material. The kidneys on close section manifested no secondary deposits and the capsules peeled readily. The lungs were quite crepitant, the heart normal; neither contained any metastases and the mediastinal glands were not enlarged or discoloured. The brain and skull were apparently normal. The eye chambers were not opened, as there were no eye symptoms.

Dr. Duhig reported on sections taken as follows:

The growth from the kidney region is a melanoma-sarcoma probably originating from the adrenal. The lymph glands from the mesentery contain abundant secondary deposits. The lymphoid bowel tissue and spleen exhibit a remarkable change in them, there are very few sarcoma cells, but the original invaders have disintegrated, leaving huge deposits of melanin in the invaded organs.

Comment.

Several interesting features are presented in this case:

1. The rarity of melanotic malignant growths, particularly in the adrenal.
2. The bilateral nature of the tumour.
3. The peculiar distribution of the secondary growths in the upper half of the small intestine and mesenteric glands corresponding to this part.
4. Absence of metastases in other organs, particularly the kidneys, liver, lungs and brain.
5. Enlargement and microscopical alteration in the spleen.
6. The perforation through one of the masses in the intestine, causing peritonitis and hastening death.

As far as I have searched the literature there seems to be very little on the subject of melanotic growths, particularly primary melanoma of the adrenal gland. Text-books in pathology similarly lack detail on this subject. Muir first points out the dispute as to the nature of melanotic tumours, some regarding them as sarcomata, others as carcinomata, whilst others think that both varieties occur. Melanotic growths in addition to arising from the pigmented coats of the eye and from the skin, do occasionally arise from the internal organs, such as the adrenals and brain. He mentions the accumulation of melanin proceeding in the cells until all detail is lost, then cells may break down and set melanin free. There is also considerable dispute as to the type of cell which forms the melanin, some say it is the function of the melanoblasts of mesoblastic origin, others that it can be formed by the epithelial cells and therefore melanotic tumours may arise from epithelium. The former hold that any melanin present in the epithelial cells is simply trans-

ferred melanin. The tendency to spread is early and very diffuse, spread being by the lymphatics as well as the blood stream, hence they are classed as probably the most malignant of neoplasms.

Bland-Sutton deals with the histological side of melanotic growths, but does not touch on the subject of melanotic tumours of the adrenals and, in the absence of any other treatise on this subject together with the peculiar situations of the metastases, it appears sufficiently rare to justify this report.

Acknowledgment.

I am indebted to Dr. E. S. Meyers, Honorary Surgeon of the Brisbane Hospital, for permission to report this case.

A CASE OF HYPERPYREXIA.

By C. HUMPHREY LLOYD, M.B., Ch.M. (Sydney),
Inglewood, Queensland.

A FEMALE child, aged twenty-one months, was seen by me about 6 a.m. on January 14, 1927. The history given was that the child had eaten several green grapes the evening before. She had had a restless night with fever and had just had a convulsion. On examination she was pale with eyes staring and turned to the right, pupils dilated and reacting to light. The body and limbs were limp. The temperature was 39.6° C. (103.4° F.). The pulse rate was 140 and the respiratory rate 40 in the minute. The tongue was slightly coated. The chest and abdomen were clear. She was ordered to hospital, but her mother refused to allow her to be taken. She was given calomel 0.12 grammes (two grains), an enema with little result and a mixture containing bromide of potash 0.3 gramme (five grains) and chloral hydrate 0.18 gramme (three grains), every two hours. Three hours later she was taken to hospital with a temperature of 40.3° C. (104.6° F.), a pulse rate of 164 and respiratory rate of 56. She was then given another high enema. This resulted in a large amount of dark green stool containing much mucus and a further wash out produced a light green stool with much more mucus. This was very offensive. The above mixture was continued and she slept fairly well after midnight. She was given nothing but cold sterile water by the mouth and a saline bowel wash out was ordered morning and evening.

At 6 a.m. on January 15, 1927, the temperature was 41.1° C. (106° F.), the pulse rate was 168 and the respiratory rate 64 in the minute; with sponging it was reduced to 40.5° C. (105° F.). At 8 a.m. she had a convulsive attack of ten minutes' duration and became very cyanosed with stertorous breathing and a very rapid, weak and thready pulse. A hot mustard bath was given and later a hypodermic injection of 0.06 mil (one minim) of "Pituitrin" with an injection of 0.3 milligramme (one two hundredth of a grain) of strychnine sulphate was given an hour later. The "Pituitrin" and strychnine were continued every two hours alternately. At 10 a.m. the temperature was 41.8° C. (107.4° F.) with a pulse rate of 184 and respiratory rate of 84. The child seemed rigid on the right side. The left arm and leg were flaccid. The pupils were dilated and turned to the right; they reacted to light. The right hand was clenched. All the limbs were moved by the child at times, though the left leg was the least moved. The knee jerks were not elicited. Lumbar puncture was done but without any abnormal result. Ten cubic centimetres of antimeningococcal serum were given. The patient was placed in ice packs with an ice compress to the head. Chloral hydrate 0.3 gramme (five grains) was given *per rectum* and retained. After the pack the temperature fell to 38.3° C. (101° F.) with a pulse rate of 172 and a respiratory rate of 88. She was quiet most of the day and at 6 p.m. she seemed much improved. The temperature was 37.5° C. (99.6° F.), the pulse rate 112 and the respiratory rate 44. She slept at intervals during the night. She awakened once, crying as if in pain, with arms and legs twitching slightly. A bowel washout was

given with good result. It was noticed that two upper front molar teeth were being cut. At 2 a.m. on January 16, 1927, the temperature was again 41.8° C. (107.4° F.), with a pulse rate of 150 and a respiratory rate of 88. With ice packs it was reduced to 37.8° C. (100° F.). During the day the temperature kept down to 38.9° C. (102° F.), but at 6 p.m. it was 40.5° C. (105° F.) and at 10 p.m. 41.3° C. (106.4° F.) and it was again reduced with ice packs to 100°. The pulse rate was 150 and the respirations numbered 60. Calomel 0.12 gramme was given in doses of 0.03 gramme every half hour starting at 10 p.m. It was followed by two grammes (thirty grains) of sulphate of magnesia and the bowel was washed out with an enema. A few thread worms were noticed in the stool. The "Pituitrin" and strychnine were continued and the mixture also given when the child was not sleeping. Ten cubic centimetres of castor oil were given at 6 a.m. and the pulse which was weak, recovered after the injection of "Pituitrin" and strychnine.

On January 17, 1927, the child seemed much better, the tongue was clean and of a good colour. Some slight twitching of the right side of the body was present. The bowels were opened with an enema; the stool was still offensive.

On January 18, 1927, the child's condition had improved, but it was very irritable and restless. At 2 p.m. the temperature was 40.5° C. (105° F.). The temperature fell after the administration of 0.12 gramme (two grains) of aspirin.

From this onwards the child gradually improved, the stools were green for a few days, but soon became normal. The child was discharged on February 4, 1927.

Comment.

The child was a spoilt one and was still being given the breast. This may account for her peevishness and irritability during recovery. If the condition had been one of fruit poisoning I should have expected diarrhoea and purging, unless the toxins produced had a paralysing effect on the bowel. This is possible, as shown by the fact that for the first few days the bowels were emptied only by irrigation and enemata. If the high temperature and convulsions were associated with teething only, I should think it an uncommonly severe reaction. This case appears to me to show the astonishing vitality of a child, as several times during the first three days I thought she would die. Apart from these times, however, she always looked well. Her tongue was remarkably clean during her whole illness.

I should appreciate any comment on the case, as in other cases of gastro-intestinal irritation due to fruit eating there has always been severe diarrhoea with purging and colic with a temperature ranging from 39.4° to 40.5° C. (103° to 105° F.) and the patients had manifested much more collapse.

Reviews.

SURGICAL PRINCIPLES.

We have read Mr. John H. Watson's book, "Fundamentals of the Art of Surgery" with great satisfaction. It is not the work of a novice, but that of a real surgeon, a man of judgement and experience. As its title denotes, it deals with the art of surgery and therefore it concentrates on practical matters. When directions as to procedure are given, these directions are not vague, but are clear, definite and unmistakable. There is practical wisdom on nearly every page.

One of the attractive features of the book is an interlude between each chapter made up of a page of short quotations, wise and shrewd and well put, from authors ancient and modern.

We were surprised and shocked to find it said that (presumably in England) the Carrel-Dakin method of wound treatment has "fallen into disuse because it needs

¹"Fundamentals of the Art of Surgery," by John H. Watson, M.B., B.S. (London), F.R.C.S. (England); 1926. London: William Heinemann (Medical Books) Limited. Demy 8vo., pp. 358. Price: 17s. 6d. net.

particular care and special apparatus." If this is true, it is a damning indictment, unless English surgeons can show something better. The author, however, strongly recommends the Carrel-Dakin technique and gives detailed instructions as to its use.

The author knows well how much that passes for surgery with the public is not surgery, but operating and much of it very bad operating too. He is continually insistent on the respect due to the tissues and on the need for gentle handling of them.

However, there are some things in the book that should not be taken very seriously. Why, after a hare-lip operation, is it so necessary to give food from a "sterile teaspoon"? Why is it so necessary, after a cleft palate operation, that the mouth should be washed out with sterile water?

The author still retains a faith in nutrient enemata of eggs and peptonized milk and he recommends as a "stimulating enema" a mixture of champagne and carbonate of soda! This lively mixture of acid and alkali must surely be a bit of treatment by magic. Our profession is not yet emancipated.

The paragraph on page 335 on acidosis should be deleted and rewritten. The explanation there given of the chemical changes in the blood is completely, hopelessly and ridiculously wrong.

ADVICE TO MOTHERS AND NURSES.

DR. LOUIS W. SAUER'S "Nursery Guide," the first edition of which was reviewed in this journal, has been enlarged and revised.¹ Several illustrations have been added and advice with regard to the diet of the older child has been included. The chapter on maternal nursing is clearly written and contains helpful advice. Artificial feeding is dealt with shortly. Rather more space than seems necessary in a guide for mothers and nurses is taken up with descriptions of foods used in abnormal conditions, such as protein milk, malt soup, eczema soup *et cetera*. A chapter on the care of the sick infant with notes on first aid of some common nursery accidents and a list of poisons and antidotes complete the book. It is well printed on good paper and the illustrations are clear. The fact that a second edition has been called for shows that it has been received with favour by mothers in the United States.

HEART DISEASE AND RHEUMATISM.

THE medical profession should feel greatly indebted to Dr. Carey F. Coombs for writing the monograph "Rheumatic Heart Disease," for, as Dr. F. J. Poynton says in a valuable introduction, the writer has dealt with the subject as an entity and not as one of the varieties of a pericarditis, endocarditis or myocarditis.² He rightly stresses the importance of Dr. Coombs's experience with rheumatism in children. Dr. Coombs holds that rheumatic infection ought to be regarded as a disease of childhood. He also infers that rheumatism in adult years is a recurrence of an infection in childhood and of course emphasizes that carditis is merely one phase, though the most important, of a general infection. He definitely asserts that the diplostreptococcus of Poynton and Paine is the specific cause of rheumatic carditis, but he does not agree with them that the controversy concerning there being a rheumatic form of ulcerative endocarditis is important. It is this certainty with regard to the infective aetiology that colours or illumines the whole book and makes the author assert for example that "the most chronic kind of mitral stenosis is an infective lesion." Stress is accordingly laid on the fact that rheumatic heart disease

¹"Nursery Guide for Mothers and Children's Nurses," by Louis W. Sauer, Ph.D., M.D.; Second Edition; 1926. St. Louis: The C. V. Mosby Company. Crown 8vo., pp. 206, with illustrations. Price: \$2.00 net.

²"Rheumatic Heart Diseases," by Carey F. Coombs, M.D., F.R.C.P. (London), with an Introduction by F. J. Poynton, M.D., F.R.C.P. (London); 1924. Bristol: John Wright & Sons, Limited. London: Simpkin, Marshall, Hamilton, Kent & Company, Limited. Post 8vo., pp. 376, with illustrations. Price: 12s. 6d. net.

is a pancarditis. He devotes a chapter to morbid physiology, wisely recognizing that function should receive as much attention as structure.

In the chapter on morbid anatomy Aschoff's nodes receive full recognition.

The cardinal symptom of dyspnoea is emphasized thoroughly and its relation to prevention is not omitted. Though the apical systolic murmur is called regurgitant, the author follows the modern trend of rather neglecting this sign, despite his statement that it is the most common murmur in rheumatic heart disease. May it not be that the reason its presence is not generally of serious moment is that it is not due usually to regurgitation?

In treatment massive doses of digitals are advised for auricular fibrillation at the beginning, but correlation between dose and the weight of the patient is not mentioned. Quinidine is not advocated, though the method of administration is described. "Novasurol" is not mentioned.

The book is well worth reading and almost prompts the assertion that if one knows rheumatism one knows heart disease.

QUININE.

THE success of their first publication in 1923 has induced the "Bureau for Increasing the Use of Quinine" to publish a second collection under the title: "Chininum Scriptioes Collectae Anno MCMXXIV, Editae."¹ The book is one of equal interest to the lay public as to the medical practitioner. Excellent photographs are included of Battista Grassi, Alphonse Laveran and Sir Ronald Ross. The first article is a transcript of a paper in Italian, together with English translation, written by Professor Grassi shortly before his death. A good report illustrated by excellent photographs is included of the journey of the Malaria Commission of the League of Nations to eastern Europe and Italy. It is surprising to find that probably the chief cause in the postwar depopulation of southern Europe and portions of Russian Asia is malaria which came in the train of war, starvation and typhus. On the subject of the treatment of malaria opinions still differ. The consensus of opinion favours administration of quinine in capsule or tablet form. Hypodermic injection is condemned and even intramuscular injection in the form of quinine urethane 0.5 to 1 gramme is distasteful to some. For children administration of a tablet with marmalade is said to be best. One of the most interesting portions of the book is that on the radioactivity of quinine. Experiments have revealed that the product of cinchona bark is an almost inexhaustible source of radioactivity and the question is discussed as to whether the therapeutic effect of the drug may not be almost wholly due to this property.

This book is well worth perusal by those interested in the malaria problem and the rendering of the tropics healthier for the white race.

THE SALICYL COMPOUNDS.

IN his "Actions and Uses of the Salicylates and Cinchophen in Medicine" Professor P. J. Hanzlik produces No. IX of the Medicine Monograph Series.² This is a summary embodying all the available literature since the introduction of salicylates into medical practice. The original intention was to pen a comprehensive review of the salicylates in rheumatic fever. However, this was changed to a joint consideration of the actions and uses of the drugs most commonly employed in the treatment of rheumatic fever as well as of the use of salicylates in other conditions. After a consideration of the historical details of the discovery and introduction into medicine of

the salicyl series of drugs an exhaustive account is given of their chemical and physical characteristics.

Part II deals with the pharmacology of the salicylates with chapters on their antiseptic properties, their absorption, distribution, excretion and fate, their effects on metabolism, on the blood, gastro-intestinal tract, kidneys and on circulation and respiration, temperature and heat regulation.

Part III is devoted to clinical considerations. Naturally chief place is given to the use of salicylates in rheumatic fever. The failure of these drugs to arrest materially or to cure the cardiac and other visceral complications of this condition is emphasized. Reference is made to the excellent results obtained by Miller and Lusk in twenty-nine out of forty-five cases of rheumatic fever by injecting from four to seventy-five million typhoid organisms as a vaccine. Other agents with which success has been obtained are also mentioned, for example streptococcus vaccines, anti-pyrim, colloidal sulphur and colloidal silver. The conclusion is drawn by the author after full consideration of the literature that the salicyl compounds have not been proved to be specific in rheumatic fever.

Part IV of the book is devoted to toxicology and Part V to methods of administration of the salicyl compounds. A very complete bibliography is appended.

EDUCATION OF THE PUBLIC IN HEALTH MATTERS.

"POPULAR EDUCATION IN PUBLIC HEALTH" by W. Allen Daley and Hester Viney sets out in popular form the authors' experiences in the health education movement and is meant to be a guide especially to public health nurses and those whose function it is to preach health in the home.¹

The recent English *Public Health Act*, 1925, permits local authorities to defray the cost of public health propaganda.

In this book the authors review the history of health education teaching at clinics, home visiting, popular health lectures, broadcasting, the film, health week and other means of passing information on personal hygiene to the people.

Especially valuable to those engaged in popular public health education are the suggested leaflets on antenatal care and public welfare from birth to two years.

This book will be of value to those who recognize that the public health movement today includes not only the prevention of disease but also the building up of robust health.

Notes on Books.

A DOCTOR HELD TO RANSOM.

THE days of bandits, shootings and ransom are not as might be expected, relics of the past. Dr. Harvey J. Howard, Professor of Ophthalmology in the Peking Union Medical College, can vouch for this. In "Ten Weeks with Chinese Bandits,"¹ published by the Cornstalk Publishing Company, he narrates experiences which will fire the imagination of all who have anything of the spirit of adventure left in their general make-up. Dr. Howard tells his story in a straightforward way. He deals with plain fact and does so in plain fashion. At times he reveals a sense of humour which is entertaining. The story of his capture, his nearness to execution and his endeavour to make himself necessary to the bandits by his knowledge of medicine and surgery, his competition in the healing art with the Chinese medicine man, his wanderings, his hunger, his knowledge of human nature, his final deliverance from captivity all combine to make a story worth reading.

¹ "Popular Education in Public Health," by W. Allen Daley, M.D., B.Sc. (London), D.P.H. (Cambridge), and Hester Viney, S.R.N.; 1927. London: H. K. Lewis and Company, Limited. Crown 8vo., pp. pp. 218. Price: 6s. net.

² "Ten Weeks with Chinese Bandits," by Harvey J. Howard, M.D.; 1927. Australia: Cornstalk Publishing Company; Sydney: Angus and Robertson, Limited. Crown 8vo., pp. 288, with illustrations. Price: 6s. net.

¹ "Chininum Scriptioes Collectae Anno MCMXXIV Editae"; 1925. Amsterdam: Issued by The Bureau for Increasing the Use of Quinine. Royal 8vo., pp. 274, with illustrations.

² "Medicine Monographs: Volume IX: Actions and Uses of the Salicylates and Cinchophen in Medicine," by P. J. Hanzlik, M.D.; 1927. Baltimore: The Williams and Wilkins Company. Royal 8vo., pp. 213. Price: \$3.50 net.

The Medical Journal of Australia

SATURDAY, MAY 7, 1927.

The Public Health.

OVER a year ago the Royal Commission on Health issued its report, a document replete with sane suggestions for the improvement of the public health. The medical profession recognized the importance of this report and much has been since written and said concerning the various proposals contained therein. In the interval the legislature in several of the States of Australia has revised the conditions under which persons in employment may receive monetary compensation and medical attention for accidents and illnesses arising out of or resulting from their employment. The medical profession responded to the invitation to participate in these schemes of curative work. The law has determined that an injured worker is entitled to receive treatment for industrial accidents and illnesses at the cost of his employer and the medical profession is prepared to give that treatment in return for adequate remuneration. In Western Australia the injured worker who is a member of a friendly society lodge, does not receive this treatment under his lodge agreement, but as a private patient and the employer is liable for the payment, provided that it does not exceed the sum of one hundred pounds. An endeavour is being made to introduce a similar arrangement in New South Wales. The medical profession wisely safeguards the interests of its members. It has, however, revealed a far greater interest in the work of repairing a machine that has become defective, than in the task of watching the machine while it is in good order and keeping it in good order. It may pay the individual practitioner better to keep to his curative work, but it is a short-sighted and narrow-minded policy. Moreover, the medical profession should realize that both activities, the curative and the preventive, should be exercised side by side, at all events while knowledge of the causation

of disease is as limited and as unsatisfactory as it is at present. The Royal Commissioners invited the whole medical profession to join in a campaign to conquer preventible diseases. They outlined a model scheme and left the details to be devised by those who would work it. A few suggestions have been made as to the tasks that the practising doctors in all parts of the Commonwealth could carry out in this connexion. No concrete plan has been elaborated. Some individual members of the profession have exhibited a sincere and keen interest in this aspect of medical endeavour. The medical profession as a whole has evinced a lukewarm interest in the various proposals and has manifested no desire to lead the way with the official hygienists to follow. When the acts for the compensation of injured and disabled workers were amended in accordance with modern views, it was only the restricted point of view, that of treating a worker for an injury or illness sustained or contracted at his work, that fired its imagination. The problem of reducing industrial accidents and illnesses to a minimum did not arrest the attention of the profession. And yet this work would be far more valuable to the worker, to the employer and to the insurer and we venture to suggest in the long run to the medical profession. It is stated that industrial hygiene is more advanced in Australia than in the old country or in any foreign land. By industrial hygiene is meant the medical supervision of the conditions of labour and the systematic effort to eliminate all removable sources of danger from the industrial environment. Unfortunately the leadership in this direction is a small boast. There is at present but little work done even in Australia to protect the worker against the noxious influences of the average factory and against the baneful effects of his own carelessness and ignorance of the fundamental principles of healthy living.

The several workers' compensation acts could be converted with little difficulty into model bases for preventive work. The law compels each employer to accept the responsibility for the results of injury and illness arising from employment; it compels the employer to insure himself against his financial liability under the acts; it gives the worker the

right of monetary compensation for disability caused directly or indirectly by his work. The employer bears no hazard, for with but few exceptions he pays a fixed amount as insurance premium and transfers the risk to the insurer. It may be admitted that treatment of accidental injury or industrial disease is expensive and not always satisfactory. The insurer would be well advised if he attempted to reduce his liabilities, if he reinsured by engaging medical practitioners to supervise the conditions of work in factories and shops with the view to the elimination of risks that can be anticipated. The insurer would have to work hand in hand with the employer and it might be necessary for the legislature to impose the same compulsion on the latter in regard to prophylactic measures as it now does in regard to insurance against his financial responsibility.

The only practical difficulty that would be encountered, if this aspect of the employers' responsibility were developed, would be to find a sufficient number of medical practitioners willing to undertake the work and sufficiently experienced to render the experiment successful. It has been said with apparent justification that no special training or qualifications are needed for a medical practitioner to become an expert industrial hygienist. Common sense and general medical knowledge are necessary. The other essential is good will.

Current Comment.

THE LEUCOCYTIC TIDE.

IN November, 1925, reference was made in these columns to the work of Sabin and her collaborators on the variations occurring in the leucocytes of normal individuals. They found that there is approximately an hourly rhythm in the number of white cells. Variations of three or even four thousand cells per cubic millimetre were seen to occur. They found that there is an afternoon rise in the leucocyte count; this rise has no relationship to the taking of food. The entire normal range of variation in the number of cells is covered rhythmically every day and the highest level is about twice the lowest. A further investigation on this subject has been made by A. F. Bernard Shaw.¹ Some of his findings confirm certain of those of Sabin and her collaborators and some of them are

at variance. Shaw selected an interval of fifteen minutes as being the shortest period in which technical accuracy could be assured. He found that large oscillations can occur in fifteen minutes which are too great to be due to technical errors. The maximum variation between two consecutive counts was from 32% to 10% and the maximum variation within each group was from 51% to 19%. He found an afternoon rise similar to that of Sabin. During the afternoon the low points are somewhat higher and the high points are considerably higher than the corresponding points before noon. If hourly curves are plotted from analyses made every quarter of an hour, the course of the former will depend to some extent on the particular point on the latter at which a start is made. Hence a fair degree of latitude must be allowed in interpreting a curve which is composed only of an extended series of hourly counts and it must not be expected that the same curve will be accurately repeated in the same person under similar conditions. A curve drawn from its hourly components may be almost flat for a considerable period and at the same time oscillations of some magnitude may be present in the analyses made at quarter-hour intervals.

As a result of the examination of five healthy adults, four of whom were examined twice under different conditions, it was found that the total number of leucocytes, exhibits two tides, a morning and an afternoon tide. The afternoon tide reveals itself at about 1 p.m. or 2 p.m. and reaches its maximum in about one to five hours. The morning tide is not so high as that occurring in the afternoon. It is at its height at about 8 a.m. or 9 a.m. Shaw points out that no attempt to explain the rises would be of any value if it did not exclude the possibility of blood concentration being responsible for the change. To exclude this he examined the number of the red cells in two instances; the curve of the red cells did not follow that of the leucocytes. It was also found that the curve of the body temperature did not synchronize with the tidal waves. It is commonly held that a leucocytosis accompanies digestion. Drysdale writing in Allbutt's "System of Medicine" laid stress on this leucocytosis and declared that this leucocytosis should be considered in making blood examinations. At the same time in the morning he found a "leucopenia of starvation." Shaw can find no evidence of a leucocytosis, either quantitative or qualitative, associated with digestion. Whether the subject is fed or starved does not affect the character of the curves. He holds that the protagonists of the digestion leucocytosis have been describing the normal ascent of the leucocytes as the physiological reaction to food. Another interesting point noted by Shaw must be mentioned. He found that the curve of neutrophile cells persistently followed the curve of the total leucocytes. The lymphocytes, on the other hand, did not follow the total curve or did so feebly only along a small sector. It will be remembered that Sabin and her collaborators claimed that the lymphocytes exhibited a half-hourly rhythm instead of an hourly rhythm which they claimed for the neutrophile cells. The finding by Shaw that

¹ *The Journal of Pathology and Bacteriology*, January, 1927.

the neutrophile cells follow the general curve is of interest when considered in conjunction with the showers of non-motile forms described by Sabin. These showers of non-motile forms were followed by a rise in motile leucocytes. Sabin regarded the non-motile forms as the dying neutrophile cells. Sabin and her collaborators mentioned the possibility that the rise might be correlated with a vasomotor phenomenon in which the leucocytes are already in the circulation, for example in the sinuses of the bone marrow. Shaw found that the leucocytes are uniformly distributed through the body in the periphery, brain, liver, kidney, lung, mesenteric vein and both sides of the heart. He was not able to obtain comparable results with the spleen and bone marrow. Both organs yielded counts grossly in excess of those of other areas, but it was obvious that cells not normally present in the blood contributed largely to the increase. He points out, however, that Webb in 1924 obtained comparable results from the spleen and bone marrow and that it must be concluded that these organs are capable of liberating large numbers of cells unless special conditions are maintained.

The study of this work must lead inevitably to consideration of the clinical significance of the leucocyte count. It is obvious that when the normal individual presents such wide variations in the number of leucocytes in the circulation, the interpretation of blood counts cannot be lightly undertaken. To gain an estimate of any practical value it will be necessary to take the time factor into consideration. In this connexion attention may be called again to a paper published in this journal by K. D. Fairley in June, 1923. This will well repay study in conjunction with the work of Sabin and her collaborators and that of Shaw. Fairley gave the normal variation as between 4,500 and 15,000. Shaw draws attention to this and points out that Fairley's findings demonstrate clearly the influence of time, but that Fairley draws no attention to the difference. Of special interest and possibly of significance are the differences found by Shaw between the behaviour of the neutrophile cell and the lymphocyte. Future study will be directed in all probability to the spleen and the bone marrow and to the factors which influence the discharge or the release of cells from these two situations. So far normal individuals have chiefly been studied in regard to the leucocytic tides. Useful information should be gained if this method of investigation were extended to such conditions as leucæmia and enteric fever in which leucocytosis and leucopenia are found.

HEART MURMURS IN SEVERE ANÆMIA.

The murmurs heard on auscultation of the hearts of patients with severe anæmia are frequently described as hæmic or functional. These murmurs are generally of a soft blowing character, not rough or loud. They are heard most frequently at the mitral or pulmonary areas and occasionally at the aortic area. In most textbooks they are described as systolic in time and some authors go so far as

to declare that all hæmic murmurs are systolic. Others, however, have described the occurrence of diastolic murmurs in patients suffering from anæmia when subsequent *post mortem* examination failed to reveal any abnormality of the cardiac valves. Among them were Friedreich and von Noorden. Hæmic murmurs have often been looked upon as a consequence of simple dilatation of the heart. Broadbent thought that they were due to a temporary loss of tone of the heart and vessels. Another suggestion was that some of them might be due to inordinate action of the papillary muscles. Mackenzie thought that simple dilatation as an explanation was far from being sufficient. He pointed out that considerable dilatation of the heart might be present without a murmur and that in the presence of very little dilatation systolic murmurs might occur with regurgitant waves in the veins. He thought that the explanation lay in the condition of the muscles supporting the auriculo-ventricular valves. He held that if the tonicity of these muscles became depressed, regurgitation ensued and gave rise to the murmur.

B. Goldstein and E. P. Boas have recently discussed functional murmurs and cardiac enlargement in severe anæmias.¹ They point out that dilatation of the heart and hæmic systolic murmurs are of little clinical interest and importance in patients with severe anæmia and that but slight attention is paid to the heart of patients with this disease. They report two cases of pernicious anæmia which presented classical signs of chronic valvular heart disease, but in which the valves were found at autopsy to be normal in every respect. In addition to the usual signs of pernicious anæmia slight enlargement of the heart was found on X ray examination. A presystolic and systolic murmur were heard at the apex and a gushing systolic murmur was audible in the fourth intercostal space 2.5 centimetres from the left of the sternum. At autopsy all the valves were found to be normal, but fatty infiltration of the heart was present. Atheromatous changes were present in the coronary arteries. In the second case both systolic and diastolic murmurs were present and microscopical examination revealed fatty infiltration of the heart muscle fibres. Goldstein and Boas also reviewed the histories of thirty-one patients suffering from pernicious anæmia and found that diastolic murmurs were present in six. Three of the patients had presystolic murmurs as well. They hold that dilatation of the heart in severe anæmia is due most probably to the deficient oxygen supply to the heart muscle. They state that Lewis has suggested that an inadequate blood supply to the heart will cause it to dilate. Goldstein and Boas apparently have set out to prove that in patients with severe anæmia the presence of cardiac enlargement, a mitral configuration of the heart and a diastolic or presystolic murmur do not warrant the diagnosis of organic valvular disease. This they certainly have done. It must, however, be held that they are fundamentally wrong in their title "functional" diastolic murmur. In one

¹ *Archives of Internal Medicine*, February 15, 1927.

of their cases they have cardiac dilatation, fatty infiltration of heart muscle and atheroma of the coronary arteries. In the other they mention fatty infiltration of the muscle fibres with hypertrophy and dilatation of the ventricle only. The murmurs in hearts such as these cannot be called functional. They are evidently dependent on pathological change. Although they have directed all their attention to murmurs and not to muscle, their communication will make all discerning clinicians pay heed to the importance of the latter.

PROGNOSIS IN CANCER OF THE CERVIX UTERI.

WHILE a correct prognosis is often a matter of extreme difficulty and is sometimes impossible to the medical attendant, it not unnaturally is of considerable moment to the patient and his relatives. In justice to the patient and for the sake of his own reputation the medical practitioner must have definite data on which to base his opinion. He may be a man of vast clinical experience and he may bring all his knowledge of human nature to play on the matter at issue, but if he lack fundamental facts he is become like the man who had not the greatest of the three graces, charity, "as sounding brass and a tinkling cymbal." The first essential to the giving of a sound prognosis is a knowledge of the nature of the disease, then there is also necessary an understanding of the way in which different types of individual react to the malady together with some insight into that intangible quality, the resistance of the patient. It furthermore behoves the medical practitioner, especially in matters surgical, to have a clear mental picture of the structure of the part of the body which is affected. Nowhere is this better illustrated than in connexion with malignant disease. Some types of tumour are more malignant than others. Some parts of the body by reason of their situation, function, blood supply and so forth are more susceptible to the spread of a cancerous process and, lastly, a surgeon who essays to remove a malignant tumour, must be thoroughly conversant with the anatomy of the part. The ability of the surgeon obviously has something to do with the prognosis. At the same time the surgeon must remember that when asked by the patient to express an opinion as to the future, he is seldom justified in stating what appears to him to be the blunt, plain and unvarnished truth. The best of prognostications may fail and it is the duty of the medical attendant to be a consoler. If there is any doubt at all, the patient should be given the benefit of that doubt, for a ray of hope can work wonders and it is as true now as it was in the days of King Solomon that "a merry heart doeth good like a medicine, but a broken spirit dryeth the bones."

Cancer of the *cervix uteri* is a condition which occasions great prognostic difficulty and some work done on this subject by Karl H. Martzloff is calculated to make the task somewhat easier.¹ In the first place

this author refers to some previous work which he has done on cancer of the cervix. He showed that apart from adenoma-carcinoma epidermoid cancers can be divided into three large groups according to the predominating type of cancer cell. These three groups are spinal cell cancer, transitional cell cancer and spindle cell cancer. As a result of his investigations in three hundred and eighty-seven cases of malignant disease, he found that the malignancy of the tumour varied in each of these three groups. His conclusions were based on the number of so-called "five year cures." Thus the percentage of five year cures in spinal cell cancer was 47, the percentage in transitional cell cancer was 24.2 and in spindle cell cancer the percentage was 9.5. It would appear that these figures may be taken as indicating the degree of malignancy of these tumours. The number of cases, three hundred and eighty-seven, was not unduly small and probably other factors, such as the age of the growth before operation, may to a large extent be disregarded. Martzloff points out that figures very similar to his were obtained by Broders in an investigation of the same nature at the Mayo Clinic. According to Broder's figures the percentage of five year cures in spinal cell cancer was 53.33, in transitional cell cancer it was 21.5 and in spindle cell cancer the percentage was 9.52.

In view of this previous work Martzloff has sought to discover whether certain fairly definite criteria can be established which will make it possible to forecast with a reasonable degree of accuracy the prospect of cure following operation for cancer of the cervix. At the outset he is careful to point out that any method designed to establish prognostic criteria possesses limitations which in the present state of knowledge are insurmountable, and he fully realizes that any scheme for prognosis may prove untenable when applied to the condition of an individual patient. Moreover, he professes to be fully cognizant of the pitfalls encountered in trying to arrive at conclusions based on a small number of cases.

Martzloff's study is based on the complete history of one hundred and forty-five patients who were suffering from cancer of the *cervix uteri* and who were operated on in the Johns Hopkins Hospital between the years 1893 and 1920. This group of one hundred and forty-five patients is taken from the three hundred and eighty-seven patients previously mentioned and they were chosen because they fulfilled the following conditions: (i) They were all operated on, (ii) they all survived the operation and left the hospital alive, (iii) their present status is known. In regard to the third condition an exception is made in the case of some patients who have been lost sight of after being traced for five years, they have therefore been classed in the group of five year cures. It is held that such a selection is necessary if any information is to be gained in regard to factors influencing prognosis. It is pointed out in passing that a steady decline has taken place in the operative mortality since such ultra-radical operations as the Wertheim procedure were abandoned in favour of a less extensive panhysterectomy.

¹ Bulletin of the Johns Hopkins Hospital, March, 1927.

Complete clinical records and all material removed at operation were studied. Blocks were made of the whole of the pathological material and sections of the whole with the pericervical area were examined. Numerous sections were taken from each block, but no attempt was made to study serial sections.

The number of patients suffering from spinal cell cancer was thirty and the present status of twenty-eight is known. All particulars in connexion with the history of these patients are given in considerable detail. Of these patients fourteen are alive and well and in each of these the symptoms were of a duration of one to eight months. While appreciating the shortcomings involved in the available data Martzloff has taken a symptom duration of eight months as the time limit beyond which an operative cure for spinal cell cancer may not be anticipated. While carcinomatous extension to the body of the uterus does not improve the prognosis, extension in this direction is of less serious import than that occurring around the cervix. Apparently the extent of cervical involvement is unimportant provided no pericervical dissemination has occurred. It is well to note that Martzloff lay stress on the importance of obtaining tissue for examination prior to radical operation. He points out that in this way a serious operation has sometimes been prevented when no cancer exists and that occasionally a cancer has been revealed when none was suspected. Radium was used in the treatment of four patients, but no details are given, because it is hoped that a special report will be made later on of this aspect of the subject. Although Martzloff realizes the smallness of the number of cases in this group, exception must be taken to the way in which he expresses his results in percentages. It has been pointed out repeatedly in these columns that an author is not justified in expressing in percentages the results of work dealing with small numbers of observations. Such phrases as "four or 57%" adopted by Martzloff, should not be used. They serve only to create a false impression.

Transitional cell cancer was the most common variety. In macroscopical appearance it does not differ from other cancers in this situation. Microscopically, however, it is distinctive, its cells resembling somewhat a well defined zone of cells seen in normal cervical epithelium which is limited above by the characteristic spinal cell layer and below by the distinctive single celled basal layer. In this group are ninety patients. Thirty-seven of these patients died within the first year and a half following operation and in eighteen a permanent operative cure took place. Pericervical extension of the malignant process occurred in thirty-seven instances and was questionable in two. All these patients died of cancer. Vaginal involvement was extensive in twenty-four patients of this group and only two could be classed as cured. Of the eighteen patients who are well, only six suffered from any cancerous invasion of the vagina. Of the thirty-seven patients with pericervical invasion thirty-six manifested extension to the vagina. Involvement of the *corpus uteri* occurred in seventeen instances,

but none of these patients were classified as cured. When the extent of cervical involvement was investigated it was found that of the "cured" patients twice as many had one-third or less cervical thickness involved as compared with those with more extensive involvement. It is thus seen that this type of cancer is more malignant than that of the spinal cell type and that extension to the body of the uterus is more unfavourable than in the latter type.

The number of patients suffering from spindle cell cancer was seventeen. Eleven died within a year and a half of operation and of the remaining six two fall into the group of five year cures. It was found that involvement of the *corpus uteri* did not altogether exclude the possibility of an operative cure, provided that uterine extension was not associated with pericervical invasion. The latter occurred in ten patients and all except one died of recurrent cancer. It is held that the criteria for operability in the spindle cell group are probably similar to those for the spinal cell group. At the same time it is thought that any patient with spindle cell cancer of the cervix with a history of over eight months' duration should be considered inoperable in so far as the possibility of a permanent operative cure is concerned.

Nine patients suffered from adeno-carcinoma. This is the rarest type of cervical character, but, unlike the rarest form of epidermoid variety, does not possess a similar degree of malignancy. Three patients of this group are alive and well and of the six patients who died of recurrence, four lived for two years or more after operation. Martzloff points out that the favourable prognosis in tumours of this kind was wholly unforeseen.

In discussing his results, Martzloff emphasizes the fact that demonstrable metastases in either the lymphatic gland, the adnexa, the bladder, the rectum or pericervical tissue render impossible an ultimate operative cure. It is clear from this work that if a prognosis of any value is to be given, the nature of the tumour as revealed by the study of microscopical sections must be known. When this has been done the duration of symptoms and the involvement of surrounding tissues may give sufficient information to justify a prognosis. Martzloff is careful to state that the criteria which he has endeavoured to determine, will be of value only if the patient survives the immediate effect of the operation. It is here that the skill and the knowledge of the operator are brought into play. Perhaps the greatest asset which a deft surgeon can have, is a thorough and intimate knowledge of the anatomy of the female pelvis. Without this he will cause a great deal of unnecessary trauma and may possibly bring about dissemination of the cancer cells and he will certainly increase the operative shock.

Although this work may not be regarded as conclusive, it offers not only suggestions, but a working basis for other workers. This is in fact the conclusion of Martzloff who hopes that his investigation may stimulate further observation.

Abstracts from Current Medical Literature.

BACTERIOLOGY AND IMMUNOLOGY.

Diagnosis of Leishmaniasis by Skin Reaction.

J. MONTENEGRO (*Annaes de Faculdade de Medicina de Sao Paulo*, Volume I, 1926) records that although the diagnosis of the skin lesions caused by Leishmaniasis presents little difficulty, the same cannot be said of the lesions which occur in the mucous membranes. These may easily be confused with syphilis, blastomycosis or tuberculosis. His investigations are based on the work of a previous investigator in Brazil whose technique he modified. He cultivated certain strains of *Leishmania* and washed the cultures obtained several times. With the washed organisms he made a suspension in a solution containing 5% sodium chloride and 4% bicarbonate of soda. This suspension was left at room temperature for three days and frequently agitated. It was then centrifuged and the supernatant fluid was used in the tests. An intradermal injection was given in the deltoid region of each patient, about two cubic centimetres being given till a papule of about eight millimetres in diameter was formed. A control injection of the alkaline saline solution was also given. Negroes had to receive their injection on the thenar eminence. A reaction was characterized by the appearance at the end of twenty-four hours of a round area two to four times the diameter of the original papule. The area is reddened, congested and indurated. In some cases the local reaction was more severe. There was no general reaction. The author injected thirty-seven persons suffering from Leishmaniasis and thirty-three (86.4%) gave a reaction. Out of thirty-six persons free from the disease, thirty-three failed to give a reaction. Three gave a slight reaction. A typical reaction is specific for Leishmaniasis and may be taken as proof that the patient is suffering from that disease when tested, if it is certain that the individual has not suffered from disease before. Failure to react reduces to 13.5% the possibility of the disease being Leishmaniasis. Reactions have been obtained at all stages of the disease, but no attempts have yet been made to produce the reaction on persons who have recovered from an attack. Injections made on persons suffering from other diseases for the most part produced no reaction.

The Cultivation of Entamoeba Histolytica.

CHARLES F. CRAIG (*American Journal of Tropical Medicine*, November, 1926) states that later observations have proved that *Entamoeba histolytica* can be satisfactorily cultivated in a mixture of seven parts of normal

saline solution to one part of inactivated human blood serum. The amoebae multiply well and cultures have been maintained for a period of over six weeks. To inoculate the medium a small lump of faecal material is mixed with the medium and incubation is carried out for twenty-four hours at 37° C. It is therefore unnecessary to use Locke's or Ringer's solutions and egg albumin, blood or dextrose are not essential additions.

Action of Antiseptics on Bacteria and Animal Cells in Vitro.

R. A. LAMBERT and J. R. MEYER (*Annaes ad Faculdade de Medicina de Sao Paulo*, Volume I, 1926) have conducted a series of experiments with a view to demonstrating the differences between the action of certain antiseptics in regard to their toxicity to tissues and their efficacy against staphylococci. The thorax of a deeply anaesthetized rabbit was opened, the blood drawn by cardiac puncture was centrifuged and the plasma stored on ice. The spleen was removed and cut up into minute fragments. The fragments were divided into three groups. The first group, covered with physiological saline solution was kept as a control. The second group was submerged in an emulsion of staphylococci in physiological saline solution. It was then subdivided, one subgroup being used as a control and one for each of the antiseptics chosen for experimentation. The third portion was subdivided and each subgroup exposed to the action of an antiseptic, without infection by the bacteria. The minute particles of splenic tissue were teased out on coverslips and each was covered with a drop of the plasma. The preparations so made were then incubated at a temperature of from 36° to 38° C. and examined at the end of twenty-four, forty-eight, seventy-two and ninety-six hours. Splenic tissue was chosen because it contains representatives of the cells which play an important part in inflammatory and reparative processes, such as neutrophil leucocytes, large and small mononuclear cells, endothelial cells and connective tissue. Staphylococcus was chosen because it is one of the commonest infective organisms, its infection is one of the most serious problems in medicine and it is one of the most resistant bacteria to the action of antiseptics. As the exhaustive study of each antiseptic involved the making of from eighty to one hundred cultures, it was decided to choose a representative from each of certain chemical groups endowed with bactericidal properties. Both substances with a therapeutic reputation of long standing and newer preparations were included. Those exhaustively studied were: Ethyl alcohol, iodine, bichloride of mercury, mercurochrome, "Acriflavine," "Protargol," "Albargenol," methylene blue, gentian violet, "Neo-Salvarsan," "Hexyl-Resorcinol" and Dakin's solution. It was noted amongst other things that there existed a narrow parallelism between the action of the germicide on the bacteria and

on the tissue cells. In most cases the staphylococci were found more resistant than the cells, even in the presence of plasma and serum which are credited with a definite bactericidal quality. The most encouraging results were obtained with iodine, bichloride of mercury and "Neo-Salvarsan." Solutions of these several times sterilized the infected material after twenty minutes' exposure without destroying the cells, although some of the latter were injured. The idea of the augmented action of antiseptics in the presence of plasma and serum was confirmed. The most favourable results of all were obtained with "Neo-Salvarsan." The results with the newer antiseptics, such as mercurochrome, "Acriflavine" and "Hexyl-Resorcinol" were distinctly unfavourable. These manifested in all cases a high degree of toxicity for the animal cells, whilst their lethal effect upon the staphylococci was distinctly inferior to that of some of the classical antiseptics. In the mercurochrome experiments a mixed culture of staphylococci and *Bacillus coli* was used. In some dilutions of the antiseptic the *Bacillus coli* was destroyed, but the staphylococci grew well. This, the authors considered, was an explanation of the favourable results obtained by some observers with mercurochrome in treatment of infections of the urinary tract.

The Use of Plasma in Complement Fixation Tests.

J. VIGNATI (*Journal of Immunology*, December, 1926) recommends the use of plasma instead of serum in complement fixation tests. The plasma is obtained by preventing the coagulation of the blood by the use of an alcoholic extract of medicinal leeches for the preparation of which full details are given.* The author claims that, in comparison with the serum tests, the plasma gives results of greater intensity. It is suggested that in certain stages of syphilitic infections the serum contains an amount of reagins which is insufficient to yield a reaction with the Wassermann test. In the plasma test these reagins are increased by the additional plasma reagins. It was found that in initial or early syphilitic infections a reaction was obtained with the plasma test nearly a week earlier than with serum. No non-specific reactions were obtained with the plasma test and in the diagnosis of tuberculous infections it was found more suitable than serum.

Scarlet Fever.

S. KORSCHUN and A. SPIRINA (*Seuchenbekämpfung der Infektionskrankheiten*, Heft 1, 1927) give a detailed account of their work with the Dick test as well as the results of immunizing the children of Moscow. Children numbering 20,870 were immunized by means of a formalin vaccine. Of these 110 were attacked by scarlet fever, 25 had only one dose, 13 received two injections, while 72 had three injections. Those children who became affected by scarlet fever after

two or three injections, were invariably those who had received small doses. The percentage of children under five years of age was much higher than for those of older periods, 15% as compared with 4-8%. Complications were rare and the injections caused no trouble. It was noteworthy that attacks following immunization were much milder and the mortality was greatly lowered. No definite conclusions can yet be made regarding the duration of immunity.

HYGIENE.

Experimental Silicosis.

E. H. KETTLE (*Journal of Industrial Hygiene*, November, 1926) holds that there is a general agreement that the prolonged inhalation of dust containing silica is dangerous to life; first, because of the chronic fibrotic changes brought about in the lungs by the inhaled dust and secondly because of the abnormal susceptibility to pulmonary tuberculosis which is apparent in silicotic individuals. But while the facts are accepted, there is by no means complete agreement as to how silica produces its characteristic lesions or how it aids the growth of the tubercle bacillus in the lungs. It is far from easy to reproduce experimentally the conditions to which the industrial worker in silica is exposed, for the ordinary laboratory animals are unsuitable for the more obvious inhalation experiments. Indirect experiments have thus to be devised and due allowance in their interpretation must be made for their artificiality. Among the other practical difficulties with which the investigator is faced in devising experiments is the fact which is apparently beyond dispute, that certain dusts, though they may contain a considerable proportion of silica, are relatively harmless. Others, though containing smaller quantities of silica, produce the characteristic results in those exposed to them. Direct experiment, however, brought forward two definite conclusions. In the first place the action of silica is a chemical one for insoluble silica (mine dust) becomes hydrolysed in the tissues and as a soluble protoplasmic poison is able to exert its action on the cells. In the second place the silicotic lung appears to be a more favourable medium for the growth of the tubercle bacillus than the normal lung, not because it is fibrotic, nor because its lymphatic drainage is interfered with, but because it contains silica.

The Married Woman Worker.

CHRISTINE M. MURRELL (*The Journal of State Medicine*, November, 1926) summarizes the special points in the health of the married woman worker due to her marriage as (i) wifehood—the problems that arise out of her dual duty as a worker in the economic labour market and as wife, (ii) pregnancy and its problems, (iii) motherhood. Considering the whole position

it is frankly not worth while to train an individual for the more complicated and expert varieties of labour, unless she is to give back to society the value of such training in the later years when she has gained experience and skill. A lengthy training is not worth while for herself, for her employers, her instructors, nor for society as a whole. The author maintains that unless a woman continues her work on marriage, only two other courses are open to her, either to adopt the celibate life or to enter only such branches of industry as require no lengthy training, thus remaining always the amateur. As regards pregnancy, most healthy women are able to continue at their work until about two months before their confinement, to resume again about three months after it. This is undoubtedly an interruption in her work which has to be faced and in some cases might retard promotion, but if such an interruption occurs only three or four times in the life of an individual, possibly less, it is not a more serious handicap than that of the individual who has two or three severe illnesses. As regards motherhood the physical well-being of children is probably better looked after by a nurse than by the mother herself, unless she has taken a special training in this which has now become a specialized branch of home life. In conclusion the author points out that the problem must be clearly faced together with the issues involved so that time, money and what is infinitely more important, the inheritance of knowledge from her instructors, may not be spent on a woman unless she intends to give back to society that which she has received. Money payment is the very smallest part of the return which may be rendered. The married woman worker should be placed under conditions which are reasonable and fair both to herself, her husband, her children and her employer.

Benzol Poisoning.

C. E. A. WINSLOW (*The Journal of Industrial Hygiene*, February, 1927) summarizes the exhaustive study by the National Safety Council of benzol poisoning. The work was undertaken by the Committee on Benzol. The Committee chose a representative group of apparently normal workers in a given industry and made a quantitative study of mechanical conditions affecting a possible poison hazard and of analytical data indicating the degree of atmospheric pollution by the poison in question. They also investigated physical findings including chemical, microscopical and physiological tests suitable for the detection of latent and incipient damage to the human body. Benzol poisoning exhibits itself in two quite distinct forms, acute and chronic, according as the exposure is brief and intense on the one hand or moderate and prolonged on the other. The danger of chronic poisoning occurs principally in the group of processes represented by the use of benzol in the rubber

industry, in artificial leather manufacture, in sanitary can manufacture, in dry cleaning and in connexion with the handling of paints, varnishes and stains. The benzol is employed chiefly as a solvent or vehicle and as a part of the process it must be removed so as to leave the originally dissolved substance in place. The method of removal of the benzol is usually to permit it to evaporate. In most cases this is done in the cold. In some instances, however, the compound may be warmed—a procedure which naturally removes the benzol with greater rapidity. The control of the benzol hazard (except where the substance is used in completely closed systems) is exceedingly difficult. In practice systems of exhaust ventilation capable of keeping the concentration of benzol in the atmosphere below one hundred parts per million are extremely rare. Even where this is accomplished there remains a decreased, but substantial risk of benzol poisoning. The number of cases coming under review makes it clear that the hazard of benzol poisoning in American industry is a serious one and constitutes one of the major problems of industrial hygiene. The field studies indicate that the provision of elaborate local exhaust ventilation and the maintenance of a comprehensive system of medical supervision are necessary to protect the worker. Certain of the higher homologues of benzene, such as toluol, xylol, and "hiflash" naphtha, are relatively free from the special hazards which attend the use of benzene itself. Manufacturers now using benzol are urged to give serious attention to the possibility of substituting one of these substances or other relatively harmless substances, wherever the conditions of a given manufacturing process make it possible to do so.

Chronic Poisoning by Tin and its Salts.

FRANK G. PEDLEY (*The Journal of Industrial Hygiene*, February, 1927) reports the case of a German, aged sixty-six, whose occupation for twenty years had brought him into more or less close contact with tin, for the most part with tin tetrachloride in connexion with the manufacture of silk. The patient had a variety of symptoms, but repeated physical examinations revealed nothing to account for them. Minute amounts of tin were present in the urine and faeces. Three cases only of alleged chronic poisoning by tin have been reported in the literature and not one of these was due to occupation. It is not unreasonable to assume that an individual who is suffering from unusual symptoms and who is excreting an unusual metal in the urine, is being poisoned by that metal. In the case of tin, however, which is such a common metal and which is ingested every day, it does not seem reasonable to attribute poisonous properties to it when only three cases can be discovered in the literature. Until other cases are added to the list, a verdict of "not proven" must be given.

Special Abstract.

SOCIAL CONDITIONS AND ACUTE RHEUMATISM.

THE MEDICAL RESEARCH COUNCIL OF THE PRIVY COUNCIL has recently issued a special report on social conditions and acute rheumatism.¹ The report has been drawn up by the Committee upon Antenatal and Postnatal Problems of Child Life. The members of this committee are as follows: Dr. G. F. Still (Chairman), Dr. John Brownlee, Dr. Hector C. Cameron, Dr. J. S. Fairbairn, Dr. Eardley L. Holland, Dr. R. C. Jewsbury, Professor M. S. Pembrey, F.R.S., and Dr. O. L. V. de Wesselow (Secretary). The observations which form the basis of the report, were made in various centres by groups of workers. These observations have been welded into one report and an introduction and a concluding chapter have been written by Dr. G. F. Still.

The chief object of the inquiry was to find out, if possible, the cause or causes which determine the special incidence of acute rheumatism upon children of the hospital class. The term rheumatism is used to indicate only the disease known as rheumatic fever or acute rheumatism with its recognized manifestations, chorea, organic heart affections and nodules. No symptoms of doubtful origin were accepted as evidence of rheumatism and all forms of rheumatoid arthritis have been excluded. All clinicians are agreed that there is a striking difference between the incidence of rheumatism on the children of the well-to-do and that on children of the hospital class. No statistical comparison of these two classes has been made, but Dr. Still in his introduction submits the following figures which may serve as an indication, although he admits that larger figures might modify in one direction or other the degree of difference. Among one thousand consecutive patients at the King's College Hospital there were 229 children between the ages of six and ten years. Of these 13.1% showed evidence of acute rheumatism; 3.5% had joint symptoms and the rest were suffering from heart affection or chorea. Among 700 consecutive children in private practice between the ages of six and ten years, there were five cases of acute rheumatism, two of joint affection, two of endocarditis and one of chorea, an incidence of 0.7%. In investigating the possibilities suggested as responsible for this difference the workers made a thorough investigation of the conditions under which rheumatism arises, the environment and the physical characteristics of the children affected. It was not possible to obtain for comparison sufficient statistics on similar lines from families of the well-to-do, so it was decided to check the results obtained as far as possible by comparison with non-rheumatic families of the hospital class.

The data on which the investigation was based, consisted of the medical and social histories of 721 families containing at least one child who had been or was under treatment for rheumatism. Of these 121 histories were compiled at the Children's Hospital, Great Ormond Street, London, 200 were compiled at the Royal Hospital for Sick Children, Glasgow, and 400 at Saint Thomas's Hospital, London. For comparison with these "rheumatic families" the histories of 200 "control families," each containing a non-rheumatic child under hospital treatment, were investigated, 100 at Glasgow and 100 in London. In addition the rheumatic histories of some 2,000 children residing in Poor Law Schools were ascertained.

The Incidence of Rheumatism in Rheumatic and Control Families.

The incidence of rheumatism was studied by enumerating the actual number of persons concerned in all the families together with the number of persons in these families believed to have had acute rheumatism, chorea or rheumatic carditis. The number of children over two years of age in rheumatic families, inclusive of patients, was 439 at Great Ormond Street, 899 at Glasgow and 1,551 at Saint Thomas's Hospital. The total number of living

children over two years of age in the control families were 462 in Glasgow and 370 at Saint Thomas's Hospital. The number of children who were stated to have died at all ages in the rheumatic families, were 74 at Great Ormond Street, 156 at Glasgow and 262 at Saint Thomas's Hospital. The majority had died under five years of age. At Great Ormond Street there was a definite history of rheumatism in six children and four had died of the effects of the disease. At Glasgow five with a history of rheumatism were said to have died of the effects of the disease. At Saint Thomas's Hospital a history of rheumatism was obtained in nine children who were dead, and eight had died of the effects of the disease. Many tables are given in the report in regard to the occurrence of rheumatism in the rheumatic and control families. It is curious that there is often a considerable divergence between the figures from the different centres. The incidence of rheumatism is traced in the brothers and sisters of the rheumatic patients and of the control children and in the parents of each group. These figures have been brought together in one table for purposes of comparison. The percentage among the rheumatic families at Great Ormond Street was 8.4 ± 1.2 , the percentage at Glasgow was 6.0 ± 0.7 for the rheumatic families and 2.5 ± 0.7 for the control families. At Saint Thomas's Hospital the percentage was 11.8 ± 0.7 for rheumatic families and 6.2 ± 1.1 for control families. The percentage of parents of non-rheumatic children said to have been affected by rheumatism was surprisingly high. In the Saint Thomas's Hospital group the percentage was 17.0 ± 3.8 and in the rheumatic families of the same group the figure was 22.3 ± 3.1 . The difference in these figures is not regarded as significant. When the occurrence of rheumatism in the brothers and sisters of the rheumatic and non-rheumatic children is examined, it is seen that the percentage of siblings of rheumatic children is in the case of the Glasgow data three times and at Saint Thomas's Hospital more than twice as high as the percentage of brothers and sisters of non-rheumatic children similarly affected. The conclusion is reached that the general picture presented by the family histories is that of rheumatism attacking several members of one generation rather than of the disease being handed down from one generation to another. In his concluding remarks Dr. Still points out that although the evidence of family incidence may indicate inheritance of the disease or of some special tendency to the disease, it may on the other hand be due to similarity of environment or to contagion. He concludes that not sufficient evidence of heredity was forthcoming.

The Incidence of Sore Throat in Rheumatic and Control Families.

The proportion of healthy throats in the control series of non-rheumatic patients was found to be definitely greater than in the rheumatic patients. Thus at Glasgow healthy throats were found among 56.8% of the non-rheumatic patients and among 39.0% of the rheumatic patients. At Saint Thomas's Hospital the figures were 36.3% and 25.8%. The differences between the proportions of healthy and unhealthy throats in the two centres were thus 17.8% and 10.5%. These findings are regarded as confirming the general belief that a close association exists between rheumatism and sore throat in childhood. It is pointed out that other observers have found a high proportion of rheumatic patients with a history of sore throat or tonsillitis. Ingermann and Wilson in 1924 found that 77% of their patients gave such a history. Starling in 1923 found that the incidence of sore throat in persons under thirty years of age suffering from mitral or aortic disease was 81.6%. Mackie in 1926 found that of 393 patients with rheumatic fever 58.8% had tonsillar infection as compared with 27.5% of 400 control or non-rheumatic patients.

When all the children in the rheumatic families were compared with all the children in the control families, it was found that in the Saint Thomas's Hospital group the numbers of healthy throats were 39.3% and 49.4%, while in the Glasgow group the figures were 55.1% and 59.7%. Significance is attached to the figures of the former group, but not to those of the latter. When the non-rheumatic members of rheumatic families were compared with non-rheumatic members of control families, it was found that the healthy throats were more numerous in

¹"Child Life Investigations: Social Conditions and Acute Rheumatism," Special Report Series, Number 114, Medical Research Council of the Privy Council, 1927.

the members of the rheumatic families. The percentages for the Glasgow group were 61.8 in rheumatic families and 59.7 in control families. In the Saint Thomas's Hospital group the figures were 54.8% and 49.4%. For further purposes of comparison the throats of 1,011 children from Poor Law schools in Sidcup and Shirley were examined. It was found that when those who gave a history of tonsillitis were included among those with unhealthy throats, the percentage of those with healthy throats was 63.5. It is pointed out that though this is necessarily an approximate figure, it corresponds fairly closely with the percentage, 59.7, found in the non-rheumatic families in the Glasgow group.

In connexion with this part of the investigation inquiry was made into the results of throat operations on rheumatic members of rheumatic families. It was found that of 907 rheumatic members of rheumatic families, 295 or 32.5% had undergone operations for removal of the tonsils. Of those who had undergone operation, 129 or 43.7% became affected by rheumatism at some time subsequent to the operation. In 106 cases the nature of the operation was described. The tonsils were enucleated in 62 instances and in 44 they were "cut." Excluding two cases in which it was stated that slight remnants of tonsils were found, there were 60 rheumatic patients whose throats were apparently satisfactorily treated by enucleation of the tonsils, but who contracted rheumatism at varying intervals afterwards. In 40 of these 60 cases or 66.7% the first attack took the form of chorea and amongst those noted as choreic four only had involvement of the heart at the time of observation. In the group of 62 patients whose tonsils were enucleated, the approximate time elapsing between the throat operation and the onset of rheumatism varied considerably. In five cases the interval was under fourteen days, in 12 the interval was under a year and in 45 the interval was from one to nine years. It is concluded that removal of the tonsils affords no protection against attack by chorea.

Evidence of Infectivity.

It is pointed out that evidence of the possibility of the transmission of infection from patients with rheumatism has been difficult to obtain in any conclusive way, as the parts played by a common environment and also by heredity in the cause of the disease are as yet undetermined. The condition of the persons who were sleeping in the same bed as rheumatic children under observation and treatment has been examined. At Saint Thomas's Hospital 198 of the rheumatic patients were found to be sharing a bed at night with one or more others. Full particulars were available in 194 of the cases. In two cases the bed fellow was under two years of age and considered not liable to rheumatism. The remaining 192 cases were analysed. The total number of bed fellows was 231 and of this number 34 were rheumatic. It was found, however, that in all but four cases the bed fellow was suffering from rheumatism before the actual patient became affected by it. In the four cases in which the bed fellow became affected after the patient, the four children were the only ones in the family liable to attack. In the remaining thirty an attempt was made to estimate the dates of onset of the disease in the patients and their bed fellows and the periods of time that intervened between these dates. This was found to be a matter of difficulty. In four instances the interval was twelve, ten, eight and seven years. In three of the families there were records of intervening attacks in other members and in one case in a sister actually sleeping in the same room. In another instance a mother had an attack of acute rheumatism ten years before her only child became affected by chorea. In seven instances the onset of the disease in the bed fellow seemed to be about one year previous to the onset in the patient, in five instances about two years, in four cases as far as it was possible to judge the attacks were simultaneous. In eight instances the patient was attacked within the same year. It is pointed out that though these figures are suggestive that transmission by close contact is possible, they cannot be accepted as proof.

Social Conditions.

A survey of the circumstances of hospital patients disclosed definite social distinctions and grades that cannot

fail to have a profound influence on the lives of the children. These grades were not defined entirely by the income of the family. Three main grades or classes were conspicuous. Class A included those whose fathers had regular and sufficient incomes, derived from skilled, clerical or superior, semi-skilled work, generally up to £4 a week or more. These families have a certain margin over bare necessities, are accustomed to a good standard of living, regular holidays, some recreation, good furniture and clothing and have outside social interests. The families of Class B have fathers in fairly regular work. In this group were included a few families in receipt of outdoor relief, because the condition of the home and general surroundings made them unsuitable for Class C. The families of Class B are normal households, for the most part with adequate furniture, but they have no margin for anything beyond the bare necessities of life. They are liable to periods of deprivation, should loss of work occur. The families of Class C are those with a history of financial distress. Their means are generally below the subsistence level, they are often in receipt of relief, have no decent furniture, are heavily in debt and are, generally speaking, of the lowest social grade with a very poor standard of living. They are too discouraged by the squalor of their lives to make much effort to improve their circumstances. It is obvious that the conditions of life are distinctly different in the three classes, even allowing for individual differences. The lot of the children will be correspondingly different. While the children of Group A have better food, clothing and training and while the parents have an attitude which as a rule is more intelligent and a good or relatively good personal hygiene, this is not so with the lower classes. In these circumstances the distribution of the rheumatic and control families is surprising. The figures from Great Ormond Street and from Saint Thomas's Hospital are tabulated. The rheumatic families in Class A from Great Ormond Street and Saint Thomas's Hospital were respectively 13.2% and 12.3%. In Class B the figures were 63.6% and 65.5%. In Class C they were 23.1% and 22.3%. In the control families of the Saint Thomas's Hospital group the figures were 17.0% for Class A, 69.0% for Class B and 14.0% for Class C. It is pointed out that these findings coincide with those of Dr. Langmead, of the London County Council. Dr. Langmead holds that the percentage of rheumatism has apparently no relation to social position and, if anything, seems less common among the poor. At the same time he pointed out that a patient with rheumatism has not the same chance of surviving among the very poor as among the better classes socially.

In an effort to explain these facts various social points were investigated. The results of these investigations are given in great detail and it will be possible to refer to some of the detail only and to the general conclusions.

Conditions of Life.

The conditions of life have already been referred to in regard to the grading of families into the different classes. The conditions correspond very closely with the three classes, A, B and C. It is concluded that 18% of the families may be said to have very good conditions and care, 38% good conditions, 30% fair conditions and only 13% actually bad conditions and care.

Maternal Care.

In estimating the factor of maternal care attention has been paid to rest and sleep, discipline and general management and whether the mother has to go to work or not. It was found that the proportion of families subject to the good type of maternal care was sensibly higher among the control than amongst the rheumatic families. It thus followed that when the degree of subjection to exposure was investigated, the children of rheumatic families were found to be more exposed than those of the control families.

Clothing.

Clothing was found to be good throughout. The Glasgow data showed that there was very little difference in the clothing in rheumatic families and in control families. The figures from Saint Thomas's Hospital, however, show that the control families had a real advantage over the

rheumatic families in this regard. This result is held to support those obtained for maternal care and exposure.

The Parents.

The parents were considered from the point of view of alcoholic tendencies, birthplace, general condition and occupation. It was found that the figures obtained suggested that the general health of both father and mother was better in the control than in the rheumatic families. More drunkenness was found in the families of Class C and it is shown that the classification into Classes A, B and C is the best criterion of the child's life, as it allows for the all-important factor, the character of the parents, especially that of the mother.

Housing.

Inquiry into the housing threw but little light on the problem. Many points were investigated, the types of houses, the position of the rooms occupied, the aspect of the room and houses, the number of rooms per family, the number of persons per room, the ventilation, the air space per person, sanitation, vermin, dust, dampness, locality as regards elevation and proximity to water courses. Overcrowding of rooms did not seem to be common amongst the rheumatic families than amongst the controls, nor was there any appreciable difference between the two as regards sanitation in London, but in Glasgow the proportion of rheumatic families living in houses with bad sanitation was appreciably higher. Neither ventilation nor lighting appeared to be any worse in the homes of the rheumatic families than in those of the controls. As a matter of fact in Glasgow there appeared to be a larger proportion of well ventilated houses occupied by rheumatic than by non-rheumatic families. The findings in regard to dampness are interesting. In view of the findings of Dr. Reginald Miller last year in his report on cardiac rheumatism these should be considered in detail. It will be remembered that Dr. Miller found that 62.2% of his patients were living in damp houses when first attacked by cardiac rheumatism. In the investigation of the London families a house was considered damp when definite and obvious evidence of dampness was present. Definite dampness was found in 22 houses out of 121, or in 18%. In 15 houses or 12% there were complaints of dampness, but with no evidence at all to substantiate them. In regard to the remaining 70% of houses the parents definitely stated that they were quite dry and they appeared to be dry. The Glasgow tenements were so constructed that persons living on the ground floor would or might be exposed to dampness. It was found that of the rheumatic families 54 or 27.3% were living on the ground floor and 144 families or 72.7% were living above this level. In the control families, numbering 100, 23% were living on the ground floor and 77% were living above this level. When the London and the Glasgow figures are combined it is seen that damp houses were occupied by 33.5% of the rheumatic families and by 23% of the control families and that dry houses were occupied by 66.5% of rheumatic and by 77% of control families. It is admitted that a higher proportion of damp houses are occupied by rheumatic than by control families, but the difference is regarded as only of probable significance. The slight difference in regard to dampness was regarded as being confirmed by the observation that a larger proportion of the rheumatic than of the control families lived in localities having an elevation little above sea level. Of the rheumatic families in London 92.8% were living at less than 50 feet above sea level and 78% of the control families were similarly placed. Figures were obtained which suggested that a higher proportion of rheumatic than of control families lived near the water courses, but in view of the standard error it was concluded that the difference could not be considered to be certainly significant. Dr. Miller concluded in his investigation that a moist atmosphere has nothing to do with cardiac rheumatism and quoted Eton College and Beaumont College, both situated on the River Thames, as being free from rheumatic infection.

Rheumatism in Poor Law Schools.

An examination was carried out of children from four Poor Law schools in order to discover the number and

percentage of children definitely suffering from rheumatism. In all 1,872 children were examined, the number of children with rheumatism was 19 or 1%. Attention is also drawn to the fact that in public elementary schools the percentage of children considered to be rheumatic is 3.6.

Seasonal Incidence of Rheumatism.

It was possible to establish the date of the onset of rheumatism with a fair amount of certainty in 459 cases in the combined data from the three hospitals. Owing to the smallness of numbers in individual years, two years, 1923 and 1924, alone could be considered. It was found that the highest incidence, 12% and 11%, occurred in November and January respectively. The lowest, 5%, occurred in July. Relapses occurring after the disappearance of the primary symptoms under treatment were noted in 91 cases. Of these relapses or fresh attacks 50% occurred in the three months December, January and February. The figures for 1923 and 1924 each comprise about one-third of the available data and, as might be expected, the graphs showing the percentage monthly distributions in these years correspond generally for all the data. It is pointed out that if allowance be made for the relatively small numbers on which the distributions for the two years are based, little significance can be attached to any apparent differences.

The Incidence of Rheumatism in Relation to Pigmentation of Hair and Eyes.

Pearson in 1904 stated that there is a correlation between health and darkness of hair colour in British school children. Macdonald in 1911 found evidence of some association between type of pigmentation of hair and eyes and susceptibility to the more common infectious fevers. The colour of the hair and eyes in the children belonging to the rheumatic and control families was recorded with a view of determining if any association could be traced between pigmentation and susceptibility to rheumatism. Differences were found in Glasgow in distributions of types of hair colour in the rheumatic and control families, but they are not regarded as significant. The data from Saint Thomas's Hospital relating to hair colour are regarded as suggesting that there has been some selection by rheumatism of medium-haired in preference to fair-haired individuals. This is in agreement with the findings of Macdonald in regard to infectious fevers. The data in regard to eye colour from Saint Thomas's Hospital and from Glasgow suggest that children with eyes of the darker shades are probably more susceptible to rheumatism than the children with blue and grey eyes. The inference that there is a predisposition to rheumatism among the darker types is at variance with the conclusion reached by Shrubals in 1903 that an excess of fair persons is found among those suffering from acute rheumatism and that the group of affections which may be termed rheumatic, manifest a special predilection for the pure blonde type.

Conclusions.

In discussing the general conclusions, Dr. Still points out that the ultimate cause of rheumatism has not been dealt with at all. That is a problem for the bacteriologist and the chemist. It seems clear, however, that apart from any specific cause there are factors entering into the causation of rheumatism which belong rather to environment, if that word is used in a very wide sense. It is with these that the investigation was concerned.

Clear evidence of family incidence was found. This might indicate inheritance of the disease or of some special tendency to the disease, but on the other hand it might be due to similarity of environment or again it might be due to contagion. As already pointed out, Dr. Still can find no sufficient evidence of heredity. The incidence of rheumatism in children of the hospital class is not in direct relation with the degree of poverty. It would seem therefore that if poverty is a factor in the incidence of rheumatism, it must be on account of some condition or conditions associated therewith which are not present in all degrees of poverty. When the findings in regard to environment previously mentioned are considered, it will be seen that the only finding to which any importance was attached, was that in regard to the eleva-

tion above sea level of the homes of affected persons. Dr. Still points out that the findings are largely negative and that those which are positive, throw no light upon the special incidence of rheumatism upon the less necessitous of the hospital patients as compared with the extremely poor. He regards it as possible that an investigation of the conditions under which the rare occurrence of rheumatism takes place in the children of the well-to-do whose environment is less similar, would throw into greater prominence any common factor of causation. As this has not been done, the findings in the Poor Law residential schools are of some value. It has first of all to be remembered that any conclusions drawn from them may have to be discounted to some degree by the fact that the children living in these institutions are possibly to some degree selected, for a child with recognized heart disease or chorea would not be sent to these schools. The fallacy, however, is probably very small, for some of the children are admitted before the age at which rheumatism usually begins, and most of the children are still within the age period at which the onset of rheumatism is most common. Dr. Still holds that with this reservation the findings at the Poor Law schools demonstrate that whatever may be the particular factor or factors concerned, children, living under the better general hygiene afforded by such institutions, are much less frequently attacked by rheumatism than children of the same class living under the ordinary conditions of a poor home.

The frequency of rheumatism in Poor Law institutions is difficult to reconcile with heredity of the disease. Moreover, the comparative immunity suggests that general care does much to prevent the disease. It is possible that the sequestered life of children in these institutions may involve less risk of exposure to infection. If this view were accepted it would imply the assumption that rheumatism may be conveyed by contagion. In the facts collected in the investigation there is no conclusive evidence of contagion, though many of the facts are consistent with this view. Even if it be granted that rheumatism is due to some infection, the incidence of rheumatism may be related to some condition in the particular child predisposing him to this infection. The studies of the children in regard to the colour of the hair and eyes and the condition of the throat offered no conclusive evidence. The fact that the proportion of healthy throats amongst the children in the Poor Law institutions in the London area was much higher than amongst children of the same class living in their own homes, suggests that environment plays some part in the production of healthy tonsils and that this is one direction in which environment affects the incidence of rheumatism.

Of the many points investigated in the course of the inquiry none have given any decisive indication as to the means which should be adopted for the prevention of the disease. Dr. Still thinks that possibly more light might be thrown on the question if the disease were made notifiable. This course would at any rate secure information as to its prevalence and distribution. He admits that notification would not be a simple procedure in view of the difficulties of diagnosis. In the meantime he holds that by raising the standard of environment and by improving the home conditions so that the possibility of contagion may be diminished, there may be some hope of reducing the frequency of rheumatism in children.

British Medical Association News.

SCIENTIFIC.

THE ANNUAL MEETING OF THE SECTION OF PÆDIATRICS OF THE NEW SOUTH WALES BRANCH OF THE BRITISH MEDICAL ASSOCIATION was held in the lecture hall at the Royal Alexandra Hospital for Children on April 8, 1927, Dr. A. W. Campbell, the Chairman, in the chair.

Annual Report and Balance Sheet.

The Annual Report and Balance Sheet were read and adopted.

Office-Bearers.

The following office-bearers for the ensuing year were elected:

Chairman: Dr. E. H. M. Stephen.

Vice-Chairmen: Dr. Harvey Sutton, Dr. Margaret Harper.

Members of Committee: Dr. A. W. Campbell, Dr. G. R. P. Hall, Dr. P. L. Hipsley, Dr. H. G. Humphries, Dr. R. A. Parker.

Honorary Secretaries: Dr. W. Vickers, Dr. M. J. Plomley.

Honorary Treasurer: Dr. R. A. Green.

Some Modifications of Nervous Disease in Childhood.

DR. A. W. CAMPBELL, the retiring Chairman, read an address on some modifications of nervous disease in childhood.

He said that before vacating the chair which it had been his honour to occupy during the past year, the final duty fell upon him of delivering an address. And since the only branch of pædiatrics upon which he felt competent to give an address concerned the nervous diseases of childhood, his choice was ready made. He would speak selectively on this broad subject of the manner in which childhood modified disease of the nervous system. He would endeavour to give an outline of some peculiarities of nervous disease as seen in childhood in comparison with adult life. And while he might tell nothing new, his remarks might be admitted as having some practical interest, because in large measure they represented everyday observations in private practice and in the out-patient departments and wards of hospitals for children.

The first pertinent difference between child and adult which he had to mention, might appear trivial and yet it had some importance because it bore on diagnosis. They all had noticed when for the first time they examined a sick child and they had gone on noticing ever since, that the child, at any rate the child of tender years, was unable to assist them with a relation of its subjective condition. The conduct of a child was swayed by its instincts. Faced by medical examination, its first thought was to escape and its second to repel or even fight, also in being emotionally unstable it was ready and apt to express fear, disgust and anger; its most distant thought was to assist the examiner. The emerging point was that diagnosis had to rest mainly, often wholly, on objective indications, in which circumstance a widely-opened eye and a full knowledge of clinical methods for the display of physical signs were most desirable possessions.

Functional Disorders.

Having touched upon the emotional nature of the child Dr. Campbell next considered some functional disorders. It was said that children were specially prone to functional disorder but this was not wholly true. If they accepted as functional those nervous disorders alone, which were neither due to destructive lesion nor faulty development, nor toxæmic nor other physical disturbance of the nervous system, they found the catalogue considerably reduced. Under this definition it was necessary to exclude a number of conditions presented in textbooks as functional, especially those described as of somatic origin. For example, tetany, cyclic vomiting, eclampsia and some spasmodic states were no more functional than was pink disease. It was obviously wrong to label a disorder as functional because they happened not to know its cause. The convulsions of infancy were often idiopathic, but perhaps as often they were the result of acute alimentary disturbance. Similarly conditions of mutism, idioglossia, so-called "congenital word-deafness" and "word blindness" were the outcome of developmental anomalies. Deaf mutes and patients with idioglossia were often credited with a high degree of intelligence. Was this correct? It might be that their intelligence ran on limited lines as in certain cases of imbecility.

In adult life hysteria, neurasthenia and migraine might be taken as providing the majority of cases of functional disorder. These conditions scarcely existed before the age

of ten years. If a child complained of headache they thought of something more serious than migraine. The vitality of childhood was proof against neurasthenia. And as to hysteria, at any rate in the form of usual physical stigmata, while common in young girls arriving at puberty and commonly taking the form of paralysis, it was seldom or never seen in younger children. Concerning the apparent paralysis following disuse of a limb, which limb has been and perhaps was still the seat of pain, this must not be mistaken for hysteria. The child was highly impressionable—not suggestible. Pain was not forgotten, unable to reason from experience and incapable of conviction it adopted the safe and natural course of locking the limb in order to escape further pain. This was observed repeatedly in cases of infantile paralysis and in unguarded moments they might overestimate the degree of residual paralysis.

So it came about that in childhood as compared with adult life the number of true functional disorders was relatively few, and yet there were enough. Children were inherently defective in inhibition, uncontrolled as to their emotions and highly imitative. Defective inhibition explained the formation of unpleasing so-called "neurotic" habits; body rocking (not a part of mental deficiency, as it commonly was), dirt-eating, nail-biting, thumb-sucking and masturbation were frequent examples. Emotional uncontrol was exemplified by head-banging, breath-holding and passionate outbursts of many kinds; while as the result of defective inhibition combined with imitativeness the various tics or habit spasms might arise; sometimes stammering would come in this category. Unfortunately although maturity of development should break these habits it frequently failed to do so. Finally, it might be asked: Could they tell the future of the neurotic child? He doubted it. Such a one might be highly emotional, the subject of violent dislikes and intolerances, morally ataxic and as sensitive as an aneroid and yet they could not declare with confidence that this child would inevitably suffer from hysteria or insanity.

Organic Diseases.

Dr. Campbell then discussed organic diseases, dealing first of all with vascular diseases of the brain. There was small doubt that after middle life vascular disease was both the most common of all organic diseases of the brain and the most common cause of paralysis. In children, however, if they excluded trauma at birth and intrauterine disease, vascular lesions were surprisingly infrequent. Seldom did they meet with a hemorrhage, seldom a softening, even a postembolic softening and this latter notwithstanding the frequency of heart disease. Clearly the explanation was that the majority of hemorrhages and softenings (excluding postembolic softenings) were the product of evolutionary changes of the nature of arteriosclerosis aided by acquired disease, to wit syphilis. Other vascular diseases to be looked for in children were those thromboses which followed by no means frequently one of the infective diseases such as measles, whooping cough or enteric fever and those associated with sepsis or profound debility.

Dr. Campbell then discussed infective diseases and said that while in its escape from vascular disease the child had the advantage over the adult, when they came to infective disease conditions were reversed. The relative frequency of meningitis in every form, excepting the syphilitic and of acute poliomyelitis and encephalitis and of chorea, if they agreed concerning its rheumatic origin, was sufficient proof of this.

Consideration of the cause of this peculiar liability need not be gone on with, it concerned the bacteriologist and the pathologist more than the clinician. Only this new thought bearing on the point might be mentioned; in children the great barrier between blood and cerebro-spinal fluid, namely the chorioid plexus, had not yet attained its full arresting capacity.

Also the peculiar clinical characters of these infective diseases in children might be passed over, at any rate those which were well known, some only, which concerned *encephalitis lethargica* and were of more or less recent

observation might be lightly touched upon. The first remarkable fact concerning encephalitis was the comparatively great liability of childhood to chronic mental sequelae. Let them consider children of the so-called "apache" or "larrikin" group, previously normal and then so changed as to be morbidly aggressive, untruthful, quarrelsome, depraved in habits and even suicidal or homicidal; also the "difficult child" group who but represented a lesser degree of the "apache" and lastly those who lapsed into blank idiocy. Let them then consider in addition the long list of physical sequelae which affected children more than adults, namely, choreic and myoclonic movements, tics, torsion-spasms and respiratory anomalies. *Encephalitis lethargica* most strikingly exemplified the modification of disease by the tissues of childhood.

In regard to tumours of the brain, to say as some did that they gave rise in children to the same cardinal symptoms as in adults was only in part true. For instance, although the child so affected might complain of headache, never was it so intense as in the adult and frequently it was altogether absent. The accepted reason determining the freedom from headache in such case was the yielding of sutures and expansion of *dura mater* which took place proportionately to age, and which in very young subjects might be obvious to the naked eye. But while these subjects might not complain of headache, their usual vitality was unmistakably suppressed and interest in their environment blunted.

As to vomiting Dr. Campbell was inclined to disagree with those who regarded it as an inconstant and unreliable symptom. It might be so in children under two years of age—in whom by the way intracranial tumours were comparatively rare—but in older children according to his experience it was the symptom which above any other suggested ophthalmoscopic examination and so led to correct diagnosis.

In the adult a tumour of the brain was often difficult to localize, in the child it was even more so. An important reason was that the tumours of children seldom involved the cerebral cortex, but tended to lie centrally and below the equatorial line of the head, often in the middle line, producing hydrocephalus, often in or near basal ganglia and often springing from ependymal or perhaps more correctly subependymal tissues. Those only which were subtentorial and involved structures in *pons* or *medulla* and of course pituitary growths, afforded clues to precise localization. In his experience those in the cerebellum, excepting tuberculomata, were hard to locate; some grew along the surface and for this reason did not proclaim their position. Finally the hopelessness of effecting cure or even palliation in the majority of cases of tumour of the brain in children was a never failing source of regret.

Turning next to diseases of endocrine glands, Dr. Campbell was first forced to remark that there was a tendency on the part of the modern practitioner both to ascribe too many nervous and mental affections in childhood to some sort of endocrinal imbalance and to expect too much benefit from endocrinal administrations in such cases. In saying this he did not wish to discourage search, especially by subtle modern tests, for signs of endocrine deficiency, nor to deny the value of endocrine medication in certain cases. He desired merely to indicate that restraint from speculation greatly reduced the positive case incidence.

Taking the glands *seriatim* and beginning with the thyroid gland, he ventured to say that while hyperthyroidism having all the indications of Graves's disease had been recorded as occurring in childhood, there were few present who had seen such a case. Hypothyroidism on the other hand was not so uncommon. It was exemplified by the sporadic cretin and was the condition which above all others responded to glandular medication. Whether French writers were correct in ascribing certain other forms of infantilism to thyroidal insufficiency was open to doubt. It was also doubtful whether tetany was rightly ascribed to insufficiency of the parathyroid gland.

Disease of the pituitary gland had analogies with disease of the thyroid gland. Thus, hyperpituitarism, or acromegaly, like hyperthyroidism had practically no place

among disease before puberty. Of hypopituitarism, now-ever, illustrated by Fröhlich's syndrome (*dystrophia adiposo-genitalis*) they frequently saw the beginnings before the age of fourteen years. Here he was tempted to discuss the pathology of these conditions, but it must suffice to indicate that the existence of pure hypopituitarism analogous to hypothyroidism exemplified by sporadic cretinism was questionable. All the cases of hypopituitarism which he had seen had been complicated by tumour formation. Conditions of dwarfism and that peculiar form called ateleiosis (type Lorain) in which the patient retained throughout life those physical characters of the age when symptoms first appeared, were also ascribed to disease of the pituitary gland.

Sexual precocity was another condition referred to endocrine disturbance and the responsible gland was believed to be either the pineal or the suprarenal. Such cases were rare. He had notes of a boy who at eight years of age had the genital development of a youth of seventeen, a cracking voice and an adolescent crop of facial acne. He had died from a cerebral tumour, which was intraventricular, placed near the *velum interpositum* and choroid plexuses and was classified as a teratoma. The point of interest and confusion was that the pineal gland was normal. He could refer also to a case of suprarenal disease in a young girl of seven years who had decided hypertrichosis and tended to assume masculine characters. Lastly to complete the list of glands, if Mott's assumption that *dementia præcox* was a product of gonadal deficiency were correct, it might be mentioned as a recent observation that *dementia præcox* might arise in early childhood.

Conclusion.

In conclusion Dr. Campbell said that there were many other features bearing on this subject which might be discussed. For example the epilepsies of childhood as compared with those of adult life, but these he left alone because during the coming session they would form the subject of debate. The numerous muscular dystrophies, all uncommon excepting the pseudohypertrophic form, were of interest notwithstanding that their relation with the nervous system remained unproved. The modifications of organic paralyses by growing tissues as compared with corresponding adult paralyses might be dwelt upon. Speculations might be made on the one hand concerning the special incidence of family and hereditary ataxias and paralyses, including Wilson's disease in children and on the other hand concerning their relative immunity from such diverse conditions as Huntington's chorea, disseminated sclerosis and amyotrophic lateral sclerosis. But perhaps he had indicated sufficiently that there was in this subject much of absorbing interest and much for future investigation and elucidation.

Dr. C. P. B. Clubbe proposed a vote of thanks to Dr. Campbell for his address. This was seconded by Dr. P. L. Hipsley and carried.

NOMINATIONS AND ELECTIONS.

THE undermentioned have been elected members of the Victorian Branch of the British Medical Association:

- Thomson, Christina, M.B., Ch.B., 1922, D.P.H., 1923 (Univ. Aberdeen), Elcho, Lara Lake.
Dyring, Valdemar Carl, M.B., B.S., 1926 (Univ. Melbourne), Brighton Beach.
Foley, Francis John, M.B., B.S., 1926 (Univ. Melbourne), St. Vincent's Hospital, Melbourne.

THE undermentioned have been nominated for election as members of the New South Wales Branch of the British Medical Association:

- McGeorge, John Alexander Hughes, M.B., Ch.M., 1927 (Univ. Sydney), Mental Hospital, North Parramatta.
Little, William Norman, M.B., Ch.M., 1925 (Univ. Sydney), Atherfield, Yass.
Eakin, Matthew John, M.B., Ch.M., 1925 (Univ. Sydney), Murwillumbah.

THE undermentioned have been elected members of the New South Wales Branch of the British Medical Association:

- Allen, Stuart Douglas, M.B., Ch.M., 1924 (Univ. Sydney), Boulevard, Strathfield.
Godsall, John Rex, M.B., Ch.M., 1926 (Univ. Sydney), Pomeroy, Macleay Street, Potts Point.
Harrison, Charles William, M.R.C.S. (England), 1926, L.R.C.P. (London), 1926, The Sanitarium, Wahroonga.
Harrison, Henley Henderson, M.B., Ch.M., 1925 (Univ. Sydney), Gordon Road, Chatswood.
Nicholl, Frederick Livingstone, M.B., Ch.M., 1925 (Univ. Sydney), Griffith Street, Manly.
Perkins, Robin Roussel McCreadie, M.B., Ch.M., 1925 (Univ. Sydney), The Manse, Ethel Street, Eastwood.

Public Health.

INDUSTRIAL HYGIENE.

AN investigation concerning the incidence of lead poisoning in motor car painters has been made by Dr. Charles Badham, Medical Officer of Industrial Hygiene in the Department of Public Health of New South Wales. The results of his investigation are incorporated in the report of the Director-General of Public Health of New South Wales for 1924.

The investigation was made among the employees in the motor car painting trade who were members of the Coachmakers' Union. One hundred men were examined and as there are only one hundred and twenty men of the union engaged in this occupation, Dr. Badham holds that the men examined may be taken as being representative of this industry. The medical examination of each man was of a comprehensive nature. The full industrial, medical and social history of each individual was taken; a complete examination of each system was made. Particular attention was paid to the reflexes, the muscular strength and to abdominal palpation. The hæmoglobin value was determined "in cases in which it appeared worth while." Blood smears were examined for the presence of basophilia and blood was taken for the Wassermann test. In addition samples of urine were submitted to chemical and microscopical examination.

Recent Investigations Concerning Lead Poisoning.

Before proceeding to describe the results of his examinations, Dr. Badham summarizes some of the recent work on the question of lead poisoning. In the first place the work of Minot, Aub, Fairhall and Shaw is of importance. These observers described typical lead poisoning as a chronic intoxication characterized by latency of development and frequent recurrences. They held that these features suggested a storage of lead in the body and that hence knowledge of the amount and localization of lead retained in the organism was of fundamental importance in the understanding of the disease. Lead is absorbed by the gastro-intestinal mucosa, the entire respiratory tract and the subcutaneous tissue. Lead entering by the gastro-intestinal tract is taken by the portal vein to the liver; most of it is removed by the liver and excreted in the bile. Gradually, however, some of the lead reaches the systemic circulation, is distributed through the organism and sooner or later causes lead intoxication. Lead compounds insufflated as solid particles are absorbed directly into the general circulation. The liver cannot exercise its protective function and the lead is picked up and retained by the skeleton. After absorption ceases, the lead retained by the organism becomes almost completely localized in the skeleton. After the disappearance of symptoms of lead poisoning a considerable amount of lead may still be retained by the skeleton. While such a store of lead is temporarily harmless and may be held indefinitely, it is in such a position that its release would flood the organism with lead and for this reason it must be regarded as a potential source of future danger.

Aub and Minot also stated that when lead is found exclusively in bones, absorption must have occurred some time previously, but there is no justification for concluding that lead was involved as an acute cause of death. Similarly the finding of lead only in the faeces and in the gastro-intestinal tract may merely indicate that lead has been swallowed and does not prove absorption. Aub and Minot also conclude that the presence of lead in the tissues or in a majority of the body tissues demonstrates active transportation of lead by the blood and signifies either that absorption has recently occurred or that considerable quantities of lead have just been liberated from the bones. In either case danger has been incurred by bathing the tissues of the body with soluble lead and lead may then rightfully be assumed to have been at least a complicating factor in the pathological picture.

Dr. Badham then refers to the work of Teleky on pallor, punctate basophilia, loss of strength and lead line. Teleky holds that each one of the clinical symptoms may appear as the first sign of the effect of lead. If either the punctate basophilia, the lead colouring or the loss of strength appears first, it will depend on the one hand on the degree of lead reception and on the other on the individual's susceptibility. The punctate basophilia is mostly seen early only when a quick reception of great quantities of lead has taken place. In general the number of punctate basophile cells is in proportion to the degree of lead reception, especially is it in proportion to the amount of lead which has been working continuously on the system, and to the degree of other symptoms or subjective complaints which are present. Dr. Badham also regards the conclusions of Sellars on basophilia as of importance. Sellars holds that the chief value of a blood film examination rests in the fact that it supplies an objective sign outside the control of the patient. While punctate basophilia is probably present in practically all cases of lead poisoning, it may be absent or present only intermittently. For this reason failure to find basophilia should not be regarded as conclusive, unless repeated examinations have been made within a reasonable time of the cessation of work. In patients with typical lead colic punctate basophilia is almost invariably present and failure to find it is strong evidence against lead as a cause of the condition. A slight degree of punctate basophilia should be regarded as practically a normal condition in men exposed to lead and is therefore a piece of evidence of no diagnostic value. A high degree is of greater diagnostic value, but is by no means a definite proof of lead poisoning. Sellars thinks it possible that further researches will disclose some method of distinguishing between lead poisoning and lead absorption.

Dr. Badham's Findings.

The Blue Line, Lead Line or Bismuth Line.

Dr. Badham holds that the majority of individuals in Sydney with a definite blue line on the gums (which when viewed by a hand lens, is seen to contain typical minute granules) owes this line to bismuth, used in the treatment of syphilis, and not to lead. He examined the gums of one hundred and forty persons who were receiving intramuscular injections of two hundred to three hundred milligrammes of bismuth every week, and he found that one in four had a typical blue line. Of the one hundred men examined eleven had a blue line and of these eleven six were regarded as suffering from lead poisoning, four were regarded as suffering from slight lead poisoning and one was regarded as suffering from no disability. The proportion of men examined who had a blue line, is seen from the fact that of the one hundred men examined, fourteen were regarded as suffering from lead poisoning and twelve were regarded as suffering slightly from that condition. In discussing the significance of the blue line, Dr. Badham states that it has the same significance as lead in the urine, but that it relates to the recent past, while lead in urine has to do with the present. It means that active transportation of lead has taken place in the body and that the tissues have been subjected to its inimical action. A blue line in his opinion arouses suspicion and calls for immediate investigation to determine if the blood-forming tissues have been poisoned which is shown by the presence of punctate basophilia in the red cells, or if the kidneys

have been affected or if a skeletal storage of lead has occurred which will be to the disadvantage of the individual.

Lead in the Urine.

In discussing the presence of lead in the urine, Dr. Badham states that in the present lack of knowledge of the amount of lead excreted daily over a period by individuals, either poisoned or not affected by the lead taken in, few or no conclusions can be drawn from the amount of lead found in the urine of a person suspected of suffering from lead poisoning, but probably a large amount is associated more generally with severe cases of poisoning than a small amount. At present the amount excreted with the urine cannot be correlated with the intake. The urine of ninety-six of the hundred persons was examined for lead. Lead was found in amounts from 0.05 milligramme per litre to 0.4 milligramme in forty-six of the samples. Lead was found in smaller amount than 0.05 milligramme per litre in the urine of sixteen men and no lead was found in the urine of twenty-five of the painters. Lead in amount of 0.05 milligramme per litre or more was found in the urine of nine of the fourteen of the men whose condition was diagnosed as lead poisoning, in the urine of six of the eleven looked upon as suffering from slight lead poisoning and in the urine of twenty-one of the remaining painters. Three of the men suffering from lead poisoning had been away from work for some time. It is seen on examination of the table giving the details found that of the specimens of urine in which no lead was found, three came from men suffering from lead poisoning, three from men suffering from slight lead poisoning and six from men with indefinite symptoms possibly due to lead poisoning.

Punctate Basophilia or Stippling of Red Cells.

Punctate basophilia was seen in the blood smears of sixteen of the hundred men. Of the fourteen regarded as suffering from lead poisoning six manifested basophilia, of the twelve men with slight lead poisoning five manifested basophilia. The signs of sixteen men were suspicious and of these two had basophilic red cells and the phenomenon was seen in the blood of four of the forty-six with no disability. Dr. Badham refers to the findings of the Broken Hill Technical Commission that punctate basophilia was not found in the blood of any person with lead poisoning at Broken Hill. He thinks that this needs confirmation before it can be accepted. It is hard to see how such finding can be confirmed, since samples of blood could not again be obtained from all persons examined by the Technical Commission. Basophilia was either present or it was not and the members of the Broken Hill Technical Commission are competent observers. Dr. Badham found no basophilia in the blood smears of twenty-five bedstead painters who were exposed to turpentine and benzine fumes (by benzine Dr. Badham means petroleum ether and not benzene or benzol). Those bedstead painters worked with lead-free paints. He points out that his findings in this regard are opposed to those of the Board of Trade inquiry that turpentine and not lead was the cause of basophilia.

Exposure to Noxious Fumes.

A present day motor car painter may be exposed to the fumes of any or all of the following substances: turpentine, petroleum ether (benzine), methylated spirits, tetraline, decaline, amyl acetate, ethyl acetate, white spirit (various petrol products), acetone, methyl acetone, methyl alcohol, ether, benzol. There were complaints to Dr. Badham from the painters that exposure to the fumes of various paints and varnishes affected them with giddiness and headache. It is well known that many of these substances produce serious ill-effects on persons inhaling their fumes. Nephritis, as is well known, may be produced by turpentine fumes. In regard to benzol and its effects some information may be gained from an abstract in another part of this issue dealing with a report on benzol poisoning by the National Safety Council. Further an interesting communication was made to this journal in February, 1926, by T. A. Kidston on intoxication following the use of coal tar paints. Dr. Badham hoped that some useful information would be obtained by comparison be-

tween the bedstead painters previously mentioned and the one hundred motor car painters who are the subject of this report, but this was impossible for the three bedstead painters of the twenty-five examined who were affected by their work, had all lead in the urine, derived presumably from sandpapering old bedsteads. "The bedstead painters are markedly exposed to benzine and turpentine fumes and a few of them complain of headaches caused by these fumes. There appears, however, to be no undue incidence of anæmia or arterio-renal disease, only one of them has granular casts in his urine, while another has marked albuminuria." On the results of an examination of twenty-five men the formation of general conclusions is unjustified.

Urine Examination.

Dr. Badham points out that the examination of the urine for granular casts and albuminuria and of the patient for increased blood pressure and thickened arteries, is of particular value in searching for the degenerative changes which occur in the arterio-renal system of individuals who are poisoned by lead. Thirteen of the one hundred men had granular casts in the urine. The importance of this result in Dr. Badham's opinion is rendered of more value by the fact that he has found granular casts in only 5% of one hundred textile workers, in 6.4% of sixty-three cellar men, in 4% of twenty-five painters working with lead-free paints and in 5.4% of thirty-seven porters. Consideration of the age groups among the painters affords no explanation of the increased incidence. Dr. Badham obviously ascribes the high percentage, 13, to lead. He does not mention the possible part played by turpentine in this finding. In regard to the significance of granular casts in the urine he refers to words of Maclean indicating that although a kidney yielding granular casts may be damaged, it must not necessarily be looked upon as inefficient. Of the thirteen men whose urine contained granular casts, eleven belonged to the groups of those with lead poisoning or slight lead poisoning. The other two men whose urine contained granular casts belonged to the group of those suffering from doubtful lead poisoning.

Blood Pressure.

Motor car painters are a group of men whose work is not laborious and Dr. Badham can see no reason for expecting an increased blood pressure, if Halls Dally's rule for calculating standard systolic blood pressure is taken. On this basis eight of the thirteen men with granular casts in the urine had increased blood pressure. Among the group of fourteen men regarded as suffering from lead poisoning were ten with increased systolic pressure, among the twelve with slight lead poisoning the number was four, among the seventeen with doubtful signs the number was seven, among the eleven with other disabilities the number was two and among the forty-six with no disability the number was twenty-five. Of the whole group of men examined the blood pressure was increased in forty-eight. Dr. Badham compares these figures with those obtained on the examination of one hundred textile workers, in this group forty-seven had an increased blood pressure with the same standard. The work of the men in the textile mills, however, is more laborious than that of motor car painters and the number of men over fifty years of age was eighteen as compared with five among the motor car painters. Dr. Badham concludes that "markedly increased" systolic blood pressure is by no means an essential feature of lead poisoning.

Conclusions.

As already mentioned Dr. Badham found that fourteen men of the one hundred were affected by lead poisoning. A résumé of the history of these men is given. It is seen that they all suffered from general symptoms and that the diagnosis was justified.

Twelve men were affected by slight lead poisoning. Three of these men gave a definite history of lead poisoning in recent years and this caused more weight to be attached to the symptoms than would otherwise have been done. Four men who complained of no very severe symp-

toms and one man who had no symptoms, manifested a degree of basophilia that supported the diagnosis of lead poisoning; three of them had a definite amount of lead in the urine. Three men with definite symptoms had pallor, the urine of two contained lead and one of these contained also granular casts; the third man had a pronounced blue line.

In seventeen of the one hundred men the condition was classed as doubtful lead poisoning because their signs and symptoms were suspicious, but not sufficient to justify a diagnosis of lead poisoning. These need not be given in detail, but it is evident that Dr. Badham has been careful to exclude from the first two groups any man in regard to whom any reasonable doubt existed. For instance the urine of eight of the men contained lead and one of them complained of abdominal pain, but there was little else to justify a diagnosis of lead poisoning. The urine of one of this group was not examined and the urine of eight did not contain lead, but they had one or more symptoms of lead poisoning.

Eleven men were affected by disability not associated with their work. This group obviously may give rise to some diagnostic difficulty. The conditions from which they were suffering, include early pulmonary tuberculosis, increased blood pressure, spinal myositis, gout, debility and poor nutrition, postinfluenza debility, bronchitis and anæmia, tertiary syphilis and alcoholism.

Forty-six men suffered from no disability. Lead was found in the urine of thirty-one of these men and punctate basophilia in the blood smears of three, one of whom had lead in his urine.

Dr. Badham holds that the incidence of lead poisoning is grave and that it calls for the suppression of all processes creating lead dust, for the periodical examination of the employees and the better ventilation of the paint shops. He urges the prohibition of the use of lead compounds in any painting process done indoors.

Correspondence.

RADIOTHERAPY.

SIR: I noted Dr. Aspinall's letter and the suggestion contained therein that it would be interesting if I gave an account of the last hundred cases treated with deep X rays. I would point out, however, that this seems to me hardly necessary in view of the results published elsewhere which would only be repeated by such publication.

The suggestion too is hardly fair if Dr. Aspinall knows that I am to be for the next six months away from case cards and practice.

Nor, Mr. Editor, do I regard it as fair to you who have during the last twelve months published one long paper for me and have promised to print another still longer article in the near future.

Perhaps when I return I may adopt Dr. Aspinall's suggestion which will certainly prove the statement published in my previous letter, but I hate labouring an argument and proving the obvious.

If in the meantime Dr. Aspinall requires any information of this sort, I am sure Dr. Bede Harrison will be able to supply him.

Yours, etc.,

E. H. MOLESWORTH.

Beanbah, 235, Macquarie Street, Sydney.
April 30, 1927.

Proceedings of the Australian Medical Boards.

VICTORIA.

THE undermentioned have been registered under the provisions of Part I of the *Medical Act, 1915*, of Victoria, as duly qualified medical practitioners:

Easson, Annie Karnachan, M.B. et Ch.B., 1924 (Univ. Glasgow), 532, Burwood Road, Hawthorn.
 Freeman, Thomas Daniel, M.B., B.S., 1926 (Univ. Melbourne), 117, Royal Parade, Parkville.
 Retallick, Thomas Grenville Clarence, M.B., B.S., 1926 (Univ. Melbourne), 6, Edward Street, Essendon.
 Thomson, Christina, M.B. et Ch.M., 1922; D.P.H., 1923 (Univ. Aberdeen), Elcho, Lara Lake.

Additional diploma registered:

Saltan, William Dixon, M.D., 1920 (Univ. Melbourne).

NEW SOUTH WALES.

THE undermentioned have been registered under the provisions of *The Medical Act, 1912 and 1915*, of New South Wales, as duly qualified medical practitioners:

Fuge, Charles Arthur Ian, M.B., Ch.B., 1925 (Univ. Glasgow), c/o. Metters Limited, Alexandria.
 Harbison, Eric Fitzgerald, M.B., B.S., 1913 (Univ. Melbourne), St. Elmo, Willowtree.
 McEnroe, Francis John, M.B., 1927 (Univ. Sydney), 69, Liverpool Street, Paddington.
 Thoms, John Allan, M.B., 1927 (Univ. Sydney), Parramatta District Hospital.

For additional registration:

Pearce, Thomas Russell, Ch.M., 1927 (Univ. Sydney).

Books Received.

TUBERCULOSIS HOSPITALIZATION, By Godias J. Drolet; Reprinted from the *American Review of Tuberculosis*; 1927. New York: New York Tuberculosis and Health Association, Incorporated. Crown 4to., pp. 25.

SHORT NOTES AND MNEMONICS OF ANATOMY, by A. S. Irving; Third Edition; 1926. Edinburgh: E. and S. Livingstone. Crown 32mo., pp. 123. Price: 1s. 3d. net.

CATECHISM SERIES: TUBERCULOSIS, by James Crockett, M.D., D.P.H., F.R.C.P.E.; 1926. Edinburgh: E. and S. Livingstone. Crown 8vo., pp. 80. Price: 1s. 6d. net.

STUDIES FROM THE INSTITUTE OF MEDICAL RESEARCH KUALA LUMPUR, FEDERATED MALAY STATES: NUMBER 20; NOTES ON MALAYAN CULICIDÆ, by A. T. Stanton, M.D., F.R.C.P., D.P.H.; 1926; John Bale, Sons and Danielsson, Limited. Crown 4to., pp. 94.

Medical Appointments.

Dr. Harry Lawton Ashby (B.M.A.) has been appointed Government Medical Officer at Barellan, New South Wales.

Dr. Archibald Jenkins (B.M.A.) has been appointed Government Medical Officer at Gatton, Queensland.

Dr. Henry Byam Ellerton, Dr. J. B. McLean (B.M.A.) and Dr. Charles Mitford Lilley (B.M.A.) have been appointed Members of the Nurses' Registration Board, Queensland.

Medical Appointments Vacant, etc.

For announcements of medical appointments vacant, assistants, *locum tenentes* sought, etc., see "Advertiser," page xx.

DEPARTMENT OF PUBLIC HEALTH, VICTORIA: Health Officer.
 RENWICK HOSPITAL FOR INFANTS, SUMMER HILL, SYDNEY: Resident Medical Officer.

WOMEN'S HOSPITAL, CROWN STREET, SYDNEY: Junior Resident Medical Officer.

Medical Appointments: Important Notice.

MEDICAL practitioners are requested not to apply for any appointment referred to in the following table, without having first communicated with the Honorary Secretary of the Branch named in the first column, or with the Medical Secretary of the British Medical Association, Tavistock Square, London, W.C.1.

| BRANCH. | APPOINTMENTS. |
|---|--|
| | Australian Natives' Association. Ashfield and District Friendly Societies' Dispensary. Balmmain United Friendly Societies' Dispensary. Friendly Society Lodges at Casino. Leichhardt and Petersham Dispensary. Manchester United Oddfellows' Medical Institute, Elizabeth Street, Sydney. Marrickville United Friendly Societies' Dispensary. North Sydney United Friendly Societies' People's Prudential Benefit Society. Phoenix Mutual Provident Society. |
| NEW SOUTH WALES: Honorary Secretary, 30 - 34, Elizabeth Street, Sydney. | All Institutes or Medical Dispensaries. Australian Prudential Association Proprietary, Limited. Mutual National Provident Club. National Provident Association. Hospital or other appointments outside Victoria. |
| VICTORIAN: Honorary Secretary, Medical Society Hall, East Melbourne. | Members accepting appointments as medical officers of country hospitals in Queensland are advised to submit a copy of their agreement to the Council before signing. Brisbane United Friendly Society Institute. Stannary Hills Hospital. |
| QUEENSLAND: Honorary Secretary, B.M.A. Building, Adelaide Street, Brisbane. | All Contract Practice Appointments in South Australia. Booleroo Centre Medical Club. |
| SOUTH AUSTRALIAN: Secretary, 207, North Terrace, Adelaide. | All Contract Practice Appointments in Western Australia. Yarloop Hospital Fund. |
| WESTERN AUSTRALIAN: Honorary Secretary, 65, Saint George's Terrace, Perth. | Friendly Society Lodges, Wellington, New Zealand. |
| NEW ZEALAND (WELLINGTON DIVISION): Honorary Secretary, Wellington. | |

Medical practitioners are requested not to apply for appointments to positions at the Hobart General Hospital, Tasmania, without first having communicated with the Editor of THE MEDICAL JOURNAL OF AUSTRALIA, The Printing House, Seamer Street, Glebe, New South Wales.

Diary for the Month.

MAY 10.—Tasmanian Branch, B.M.A.: Branch.
 MAY 10.—New South Wales Branch, B.M.A.: Ethics Committee.
 MAY 12.—Victorian Branch, B.M.A.: Council.
 MAY 12.—New South Wales Branch, B.M.A.: Clinical Meeting.
 MAY 13.—Queensland Branch, B.M.A.: Council.
 MAY 16.—New South Wales Branch, B.M.A.: Organization and Science Committee.
 MAY 17.—New South Wales Branch, B.M.A.: Executive and Finance Committee.

Editorial Notices.

MANUSCRIPTS forwarded to the office of this journal cannot under any circumstances be returned. Original articles forwarded for publication are understood to be offered to THE MEDICAL JOURNAL OF AUSTRALIA alone, unless the contrary be stated.

All communications should be addressed to "The Editor," THE MEDICAL JOURNAL OF AUSTRALIA, The Printing House, Seamer Street, Glebe, Sydney. (Telephones: MW 2651-2.)

SUBSCRIPTION RATES.—Medical students and others not receiving THE MEDICAL JOURNAL OF AUSTRALIA in virtue of membership of the Branches of the British Medical Association in the Commonwealth can become subscribers to the journal by applying to the Manager or through the usual agents and booksellers. Subscriptions can commence at the beginning of any quarter and are renewable on December 31. The rates are £2 for Australia and £2 5s. abroad *per annum* payable in advance.

CHRYSLER

QUALITY IS STANDARDIZED

Chrysler Standardized Quality is a fixed and inflexible quality standard which enforces the same scrupulously close limits—the same rigid rule of engineering exactness—the same absolute accuracy and precision of alignment and assemblage—in the measurement, the machining and the manufacturing of every part, practice and process in four lines of Chrysler cars.

Thus "purchaser's risk" is eliminated. The purchaser is assured of absolute safety. He knows that every Chrysler—from the lowest-priced to the highest-priced—is the supreme value in its class. That the value of each is unquestionable.

Built As Only Chrysler Builds

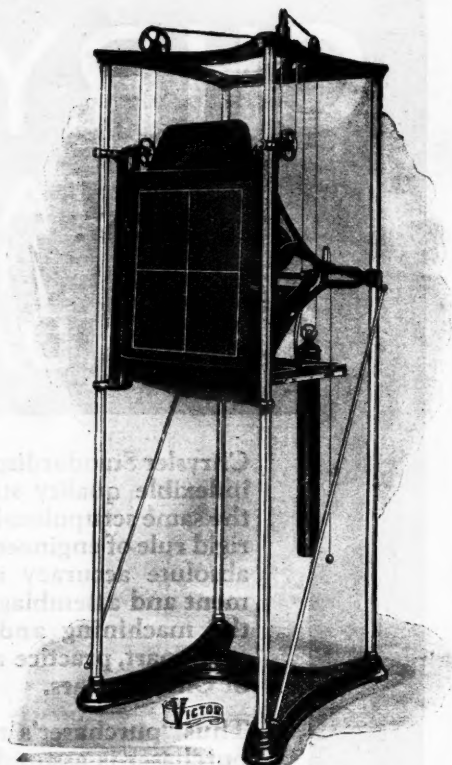
AUSTRALASIAN DISTRIBUTORS:

N.S.W.: Larke Neave & Carter Ltd. Grenville House, William Street Sydney.
Vic.: Collins Motors Pty. Ltd., Chrysler House, Collins Street, Melbourne.
Qld.: Ward Motors Limited, Wickham Street, Brisbane.
Sth. Aust.: O. T. Rodda Motors Ltd., Flinders Street, Adelaide.
West. Aust.: William Attwood, 299-301 Murray Street, Perth.
Tas.: Chrysler Motor Co. Pty. Ltd., Hobart and Launceston.
N.Z.: Todd Motor Company, 97 Courtenay Place, Wellington.





Victor
Manufactures
 joined
 with
WATSON
SERVICE



Victor Balanced Cassette Changer.

Provide the X Ray worker in Australia with
 advantages rarely equalled and not excelled
 in any part of the world.

*Fullest information on X-Ray and Physio-Therapy equipment gladly supplied upon
 receipt of request.*

W. Watson & Sons Ltd.

SYDNEY: 15, CASTLEBAGH STREET.
 MELBOURNE: 117, COLLINS STREET.
 BRISBANE: 357, QUEEN STREET.

WELLINGTON, N.Z.: 132, CUBA STREET.
 AUCKLAND, N.Z.: 228, QUEEN STREET.
 ADELAIDE: EVANS BUILDING, JAMES PLACE.

FACTORY: CARLTON, VICTORIA.